SAN FRANCISCO DEPARTMENT OF CITY PLANNING 100 LARKIN STREET · SAN FRANCISCO, CALIFORNIA 94102

DRAFT
ENVIRONMENTAL IMPACT REPORT

Spear and Main Street Office Building

EE 80.349
November 1981

Publication Date: 6 November 1981
Public Comment Period: 6 November 1981 through 10 December 1981
Public Hearing Date: 10 December 1981

Written comments should be sent to the Office of Environmental Review, 45 Hyde Street, San Francisco, California 94102

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Spear and Main Street office building : draft 1981.

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SUMMARY

PROJECT DESCRIPTION

The proposed Spear and Main Street Office Building would be located between Spear Street and Main Street, approximately in the center of the block bounded by Mission, Main, Howard and Spear Streets, San Francisco, California.[1]

The project sponsor, Vintage Properties-Spear Street, with offices in Menlo Park, California, holds a long-term lease on the project site. Vintage Properties-Spear Street desires to construct an office building on the property to lease space to tenants providing professional services that would occupy 1 to 2 floors each. Tenant firms would be national and local companies in the fields of law, accounting, engineering and design and sales. Retail shops are proposed for ground floor of the project. The project sponsor would seek a reasonable return on investment capital.

The proposed project would consist of a structure containing 19 floors rising 240 feet above the surrounding grade. The project would contain a gross interior floor area of 306,500 square feet with net rentable space of 279,060 square feet excluding 18,700 square feet of short-term parking space for 36 cars. Of the total net rentable space, retail space would contain 7,460 net rentable square feet. Office space would consist of 271,600 net rentable square feet.

The project would be constructed using steel framing and precast concrete panels covered with brick tiles. The glass would be dark grey or dark bronze held in place by aluminum window frames of the same color. The corners of the building would be truncated, set at a 45° angle to the building sides.

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[1]Assessor's Block 3717, Lots 5, 10 and 11.

Construction of the shell would be expected to cost about $18,000,000 (1980 dollars) with tenant improvements costing about $5,500,000. Construction would be expected to occur over about a 2-year period beginning in late 1982 and completed in late 1984.

The proposed project site is located in the southeastern part of the C-3-O (Downtown Office) district. Professional and business offices are permitted uses in this district as are related facilities such as retail and services uses and places of assembly and entertainment. The basic floor area ratio (FAR) allowable in the C-3-O district is 14:1. The proposed project would have a total gross floor area of 306,500 square feet and thus a FAR of 12.2:1.

The proposed project would be subject to Discretionary Review by the City Planning Commission.

IMPACTS AND MITIGATION MEASURES

A. LAND USE

Impacts: The proposed project would be part of a trend of increasing intensification of office development in the South-of-Market area. Cumulatively, this may create secondary impacts in the form of further development of support retail shopping and service-related establishments to serve the increased employee population. It may also contribute to create "spillover" effects such as increased land demand in the South-of-Market area, employment displacement and increased housing demand.

B. TRANSPORTATION

Impact: The proposed project would generate a total of 5,000 daily person trips of which approximately 2,700 would be work trips and 2,300

would be non-work trips. Approximately 1,000 of the daily trips would occur during the evening peak hour.

In establishing base traffic conditions without the project, it must be recognized that traffic increases will result from the already approved downtown development. If auto commuting increases at the same rate as transit travel, the total peak hour auto travel in the downtown area could increase by approximately 30% in 1983 (the proposed project would represent approximately 4% of this increase).

Mitigation: Upon completion of the project, the project sponsor would request tenant firms to implement a flexible time system for employee working hours and a preferential parking program for carpools and vanpools to reduce peaks of congestion in the transportation system.

Impact: The committed downtown development would increase MUNI ridership by about 7,151 trips during the P.M. peak hour (the proposed project would add about 288 P.M. peak hour trips). Although some added capacity would occur in bus service (Muni staff indicates some articulated coaches will be obtained), and the MUNI Metro light-rail service, the overall capacity increases by 1983 would be about 10-15% during the P.M. peak hour.

Mitigation: The project sponsor would contribute to a fund for maintaining and augmenting transpor-

tation service, in an amount proportionate to the demand created by the project through an equitable funding mechanism such as an assessment district, which would meet the peak demand generated by cumulative office development in the downtown area.

Impact: The project would generate demand for approximately 340 long-term parking spaces and 145 short-term parking spaces. The majority of the demand would need to be accommodated at other locations in the area where current parking occupancy rates are about 85%-95%.

Mitigation: The project sponsor would participate in any future areawide study of current parking conditions and future needs. If new short-term (or long-term) parking is determined appropriate in the downtown area, the project sponsor would participate in the equitable funding of such facilities through a special assessment district according to criteria determined by the study.

C. AIR QUALITY

Impact: During construction, earthmoving and grading would generate dust and suspended particulates.

Mitigation: Watering to control dust on-site during construction would be done twice daily by the project sponsor.

Impact: From a cumulative standpoint, a 1980 ABAG study of regional air quality found that photo-

chemical oxidants would be a persistent problem in the future, and that reductions in hydrocarbons and oxides of nitrogen emissions would be necessary to attain the federal standard for photochemical oxidant (ozone) in the Bay Area.

Mitigation: Mitigating transportation impacts would also mitigate air quality impacts. These measures would include car-pooling, van-pooling, and staggered work hours.

D. NOISE

Impact: During foundation construction, the major noise source would be pile driving, which would last about 3 weeks. During pile driving, noise levels of approximately 105 dBA at 50 feet could be expected. After the pile driving phase, the impact torque wrenches, the loudest of non-piledriving equipment, would emit noise levels of 95 dBA at 50 feet, as measured in downtown San Francisco.

During pile driving, office workers in adjacent buildings would not be able to carry on a conversation, would not be able to use the telephone, and would be distracted from their work and would probably complain to the management. Vibration levels would be great enough to shake the buildings.

The use of impact wrenches would be intermittent during framing of the building, but workers in offices nearest the noise source

would not be able to use the telephone or carry on a conversation when the impact wrenches would be in use.

Mitigation: To mitigate pile driving noise impacts the project sponsor has agreed to limit pile driving to between the hours of 1 P.M. and 4 P.M. A wood construction barrier would be installed around the project site and would be effective in reducing noise levels by up to 15 dBA at the lower floors of nearby buildings.

E. VISUAL QUALITY AND URBAN DESIGN

Impact: At increasing heights in adjacent buildings, views from those buildings would be blocked up to the building's 19th floor level; the degree of view blockage would vary with respect to elevation and observer location in relation to the project.

Mitigation: A lower building would avoid obstructing views from the upper floors of adjacent buildings. To optimize a financial return on rentable space, the project sponsor is not proposing to construct a structure of lower height containing fewer gross square feet.

F. SOILS AND SEISMICITY

Impact: If a severe earthquake, such as the 1906 San Francisco earthquake of estimated Richter magnitude 8.3, were to occur along the San Andreas Fault in the Bay Area, violent ground-

shaking could have such effects as cracking building walls and permanent deformation of structural members.

Mitigation: Geotechnical engineering investigations including test borings would be done to determine soil characteristics and thickness, to recommend specific foundation design and to determine whether dewatering would be necessary and safe relative to adjacent structures. Results and conclusions of these technical studies would be taken into account in design plans for the proposed building.

The structure would be designed to meet the seismic design standards of the Uniform Building Code (UBC) and the Structural Engineers Association of California (SEAOC). Computer analysis of the structural frame would be performed in order to design the seismic restraint of the structural frame.

G. HISTORICAL RESOURCES

Impact: It is not feasible to rule out the possibility of encountering historical resources or a buried hulk (or a portion thereof) during construction of the new structure.

Mitigation: If historical artifacts or a buried hulk are discovered during construction of the proposed project, the contractor would stop work in the area of the find to permit professional evaluation and/or retrieval of the find.

H. ENERGY

Impact: Assuming a potential 50-year lifetime for the building, the estimated lifetime energy cost (including construction, operation, transportation and removal) would be about 4 trillion BTU. This is equivalent to approximately 740,000 barrels of crude oil.

Mitigation: The proposed project would comply with Title 24, Division 20, Article 2 of the California Administrative Code regarding energy conservation standards and energy consumption.

I. ECONOMICS

Impact: In constructing the project, a total of about 360 person years of construction labor would be generated. When completed, the net annual increase over existing composite property tax revenues to San Francisco would be between $218,800 to $277,800. It would be expected that the project revenues to San Francisco would exceed the incremental costs directly attributed to the project at the time of construction, although Proposition 13 limitations on property tax increases could change this prediction during the life of the building.

J. GROWTH INDUCEMENTS

Impact: The project would continue the trend of intensifying office uses in the downtown area, specifically south of Market Street. Together with other new office development near the site, it could stimulate further office growth in the immediate

vicinity, on lots now used for parking or in low-rise structures containing business services (such as printers and office suppliers) and light industrial uses (such as warehousing). Employee purchasing power could stimulate employee-oriented retail activity in the site vicinity. According to a formula provided by the Department of City Planning, the project would create a demand for 259 dwelling units in the City.

Mitigation: The project sponsor would apply good faith efforts to build and/or rehabilitate housing units in the San Francisco Bay Area in order to alleviate the housing demand attributable to the project.

ALTERNATIVES

Alternatives to the proposed project considered include the no-project alternative, alternative uses of the site, development without interim bonus controls, alternative design and development according to a series of regulatory proposals for managing downtown development prepared by the Department of City Planning.

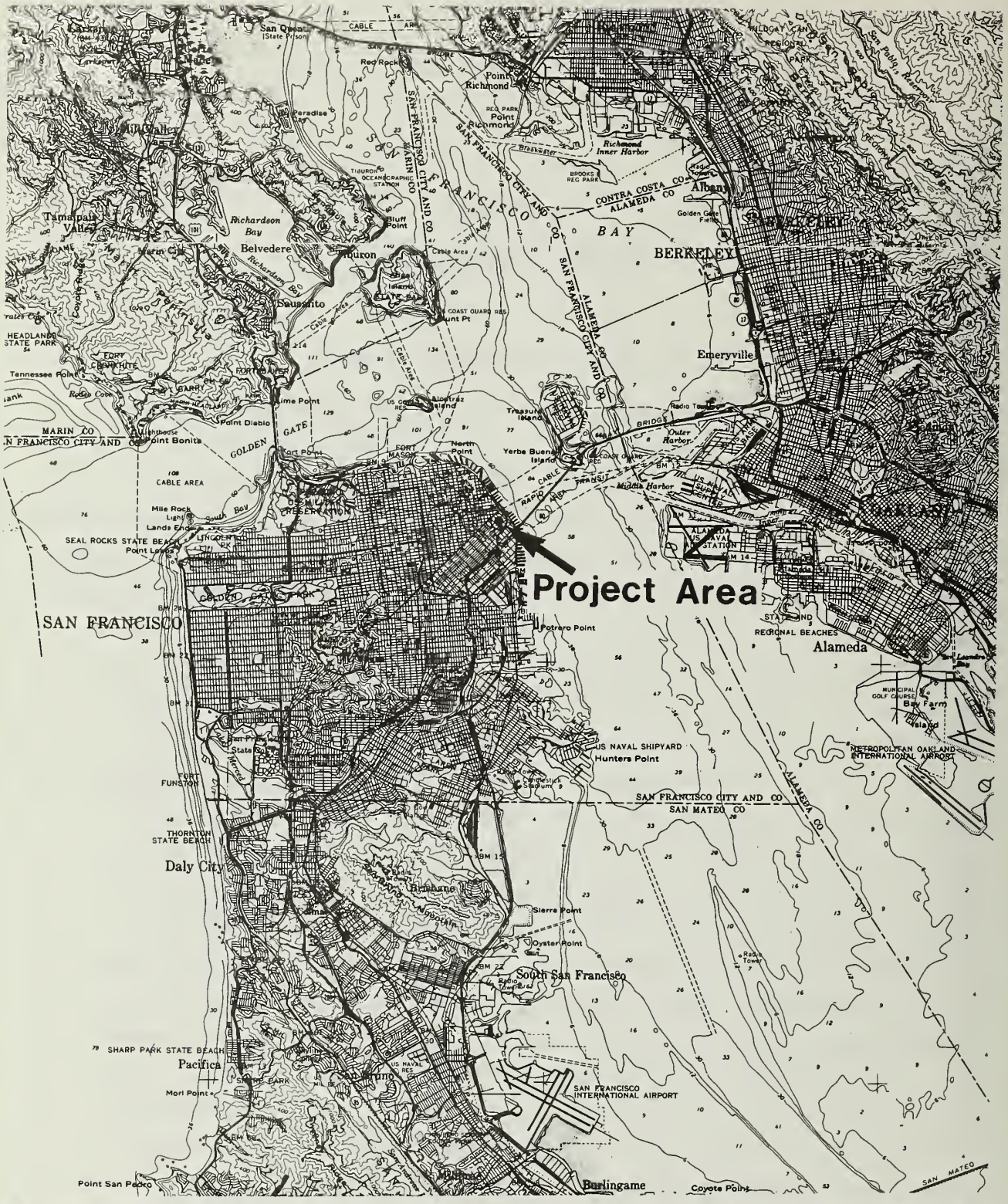
CHAPTER I

PROJECT DESCRIPTION

A. LOCATION AND OBJECTIVES OF PROJECT SPONSOR

The proposed Spear and Main Street Office Building would be located between Spear Street and Main Street on Assessor's Block 3717, Lots 5, 10, and 11, approximately in the center of the block. The block is bounded by Mission, Main, Howard and Spear Streets, in the South-of-Market area of San Francisco. The project site measures 137.5 feet along Main Street, and 45.8 feet along Spear Street, and contains a total site area of 25,208 square feet. The general location of the project site is shown in Figure 1, page 2. The precise location of the project site and its shape is shown in Figure 2, page 3.

The project sponsor, Vintage Properties-Spear Street, with offices in Menlo Park, California, holds a long-term lease on the project site. Vintage Properties-Spear Street desires to construct an office building on the property to lease space to a series of tenants providing professional services that would occupy 1 to 2 floors each. Tenant firms would be national and local companies in the fields of law, accounting, engineering and design, and sales. Retail shops are also proposed for the ground floor of the project. The project sponsor would seek a reasonable return on investment capital (see Chapter II.J., Economics, page 51), and bases projected tenant demand on the project sponsor's observed historical trends on leasing patterns in the area indicating a continued need for office space in San Francisco. Specific major tenants are not known at this time.



Regional Location Map

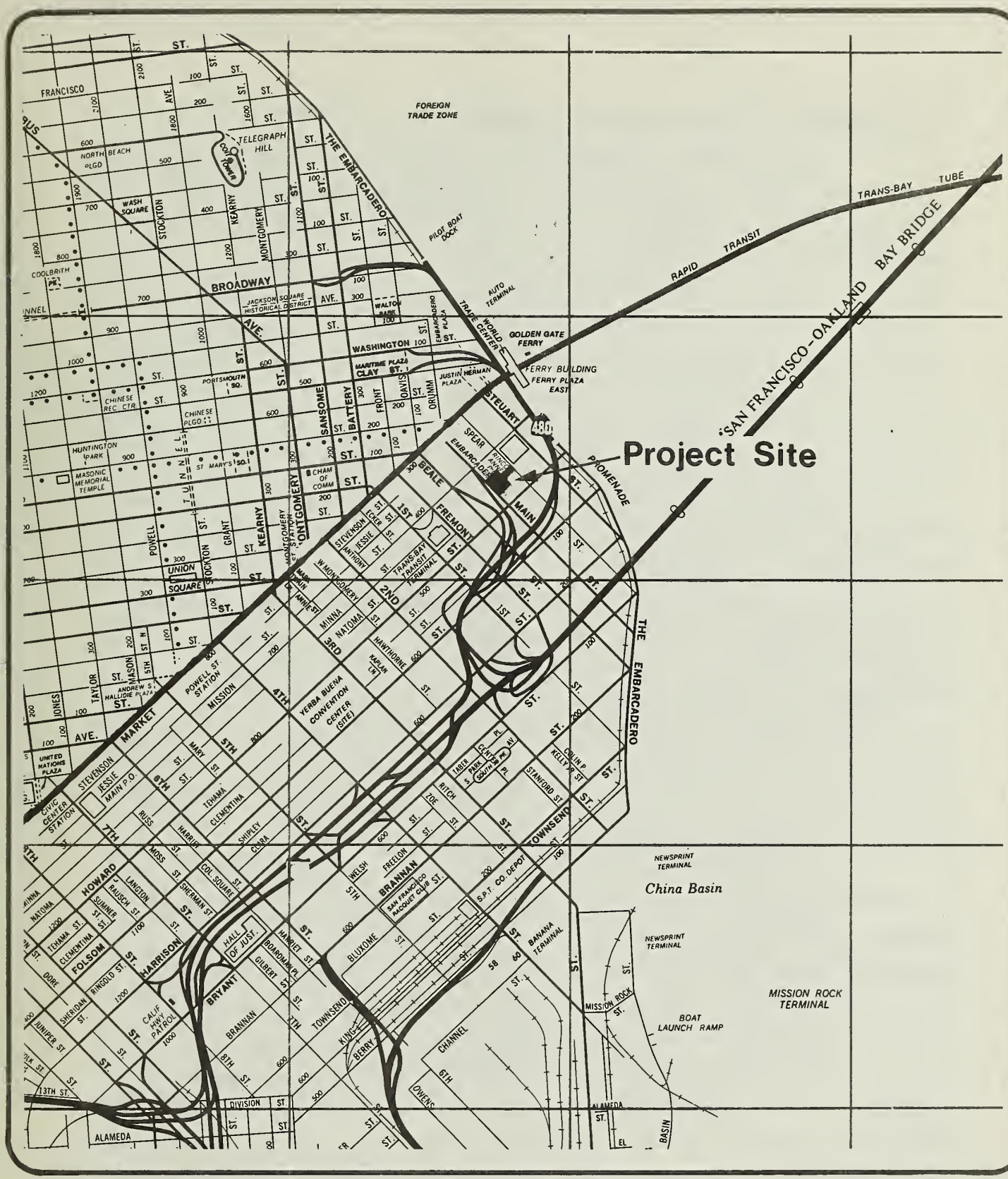
North

0 1 2 4

Scale Miles

Source: USGS

Figure No.1



Site Location Map

Basic map reproduced by permission of the California State Automobile Association, copyright owner.

North

0 500 1000 2000

Scale Feet

Figure No. 2

B. PROJECT DESCRIPTION AND SCHEDULING

The proposed project would consist of a structure containing 19 floors (excluding the mechanical penthouse and elevator core machine room) rising 240 feet above the surrounding grade (Figures 3, 4, 5, 6 and 7, pages 6, 7, 8, 9 and 10). The building would measure 117.5 feet along Main Street and would be 132.5 feet deep (excluding bay windows which would project outward from the building face), extending to the interior portion of the block, (Figure 8, page 11). The north and south facing walls would be set back 10 feet from the north and south property lines. The east facing building wall would be set back 5 feet from the east property line and the west (Main Street) facing building wall would coincide with the west property line (Figure 10, page 14).

The building would have setbacks of 15 feet from the adjacent Howard and Main Street Building to the south, and 22½ feet from the the proposed adjacent 115-135 Main Street Building to the north above the ground floor. The ground floor wall along Main Street would abut the ground floor wall of the 115-135 Main Street Building. The northeast building face would be set back 17 feet from the southwest face of the 150 Spear Street Building, currently under construction.

The project would contain a gross interior floor area of 306,500 square feet with net rentable space of 279,060 square feet, excluding about 18,700 square feet of tenant parking space for 35 cars in the basement (Figures 9 and 10, pages 13 and 14). Tenant parking is proposed by the project sponsor as being necessary to meet the minimum needs of the tenants expected to lease office space, and would replace a portion of the 145 parking spaces that previously occupied the site (see Section II.A., Land Use, page 19). Of the total net rentable space, ground floor retail space would contain 7,460 square feet. Office space would consist of 271,600 net rentable square feet. A truck loading and unloading area, freight storage and electrical equipment would be contained on the ground floor (Figure 8, page 11). Truck access would be off Main Street.

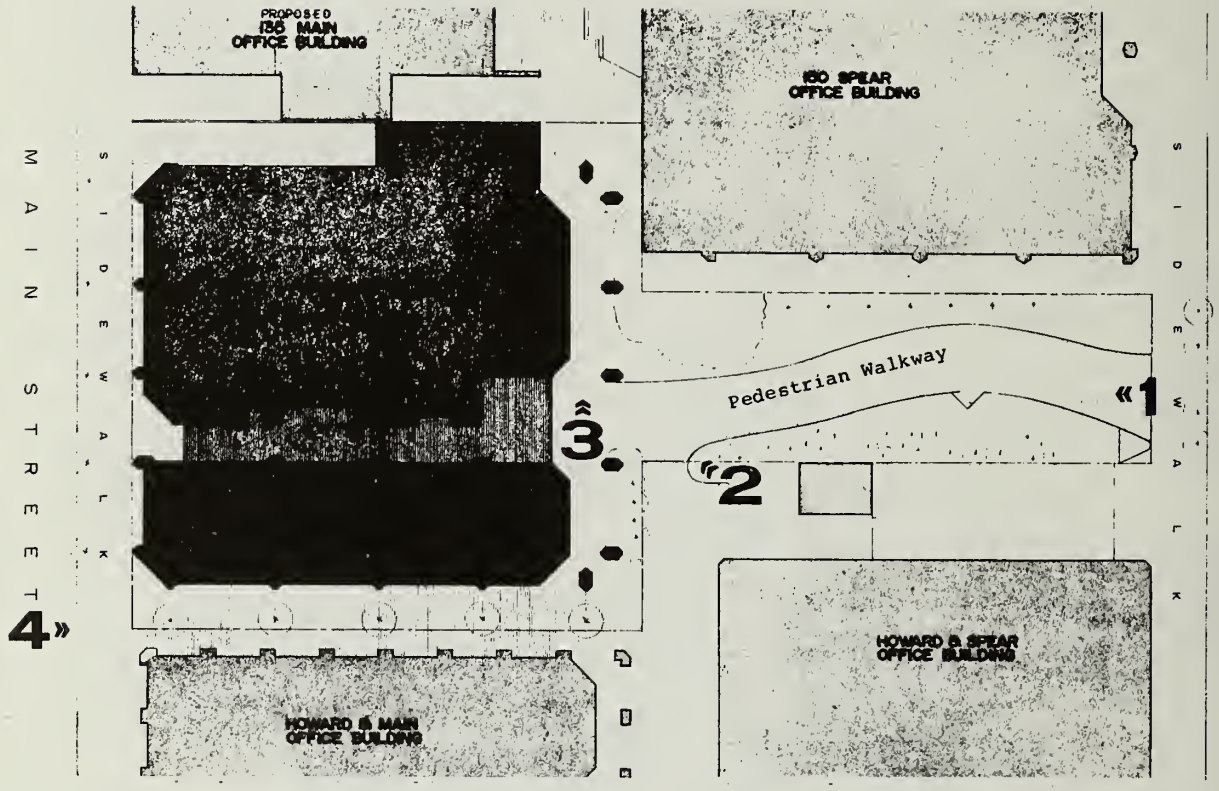
The project's main pedestrian entry would be off the landscaped pedestrian plaza extending west from Spear Street. The ground floor would contain a lobby with a building directory adjacent the elevators near the center of the structure. An open-air walkway would extend south from the main entry to connect to an existing walkway leading to Howard Street between the Howard and Spear Street Building (Borel Building) and Howard and Main Street Building (Figure 8, page 11). An open-air walkway would also lead north to connect to the proposed 115-135 Main Street Building (Section III.E., Impacts, Visual Quality and Urban Design, page 77).

The project would be constructed using steel framing and precast concrete panels covered with brick (Chapter II.E., Visual Quality and Urban Design, page 40). The glass would be dark grey or dark bronze held in place by aluminum window frames of the same color. The corners of the building would be truncated, set at a 45° angle to the building sides.

Construction of the shell would be expected to cost about $18,000,000 (1980 dollars) with tenant improvements costing about $5,500,000. Generally, an "open landscape" scheme using moveable partitions and walls capable of being relocated to accommodate varying office space functional needs are envisioned for the leasable office space. Construction would be expected to occur over about a 2-year period beginning in mid-1982 and completed in mid-1984. First tenants would be expected to occupy portions of the structure in April or May of 1984 with remaining tenants continuing to move in for the remainder of 1984 and into 1985. Architects for the proposed project are Jorge De Quesada, Inc., with offices in San Francisco.

C. ZONING

The proposed project site is located in the southeastern part of the C-3-0 (Downtown Office) district (Figure 11, page 15). Professional and business offices, retail services, places



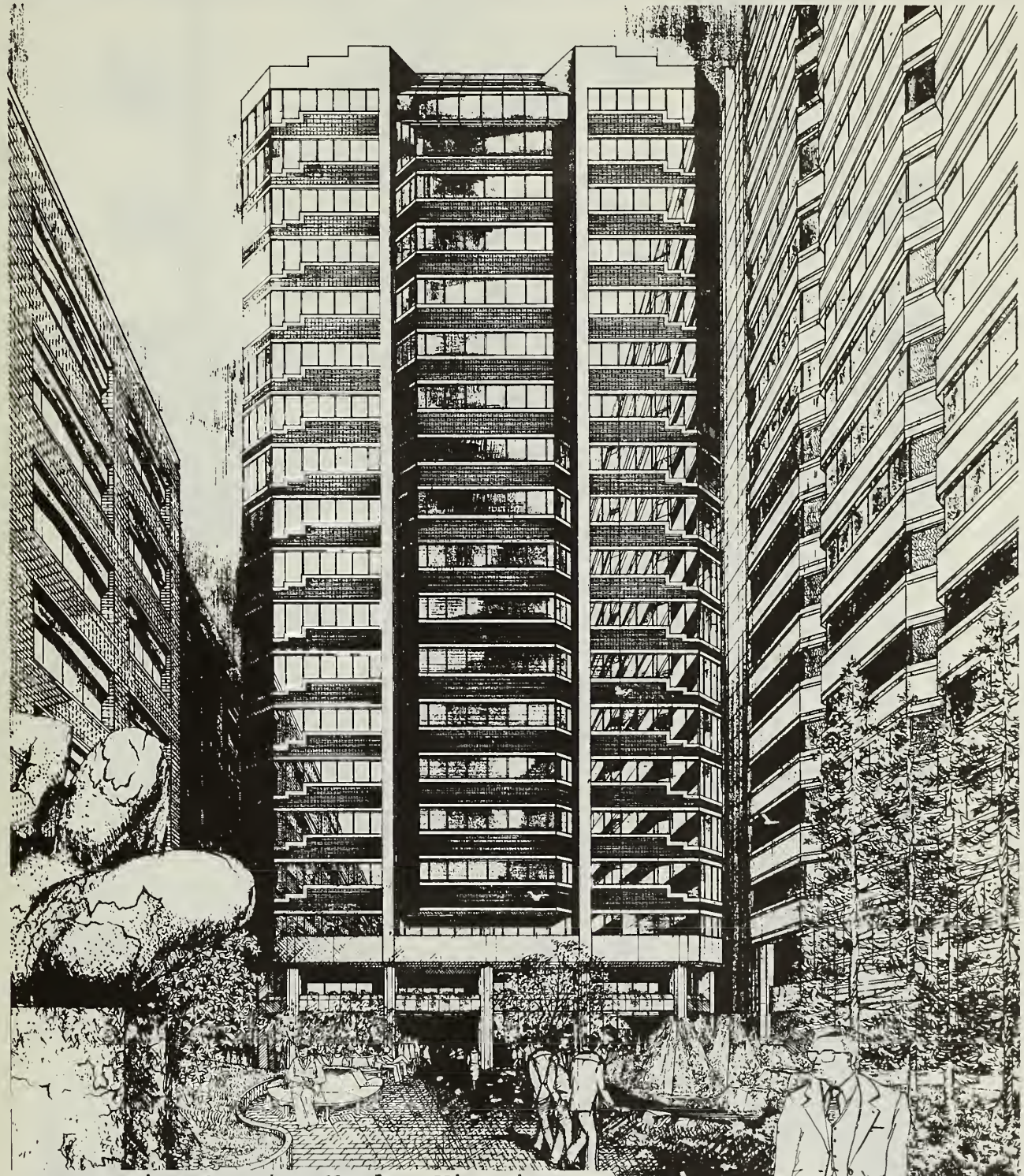
Plan showing perspective drawing locations

North

0 10 20 40

Scale Feet

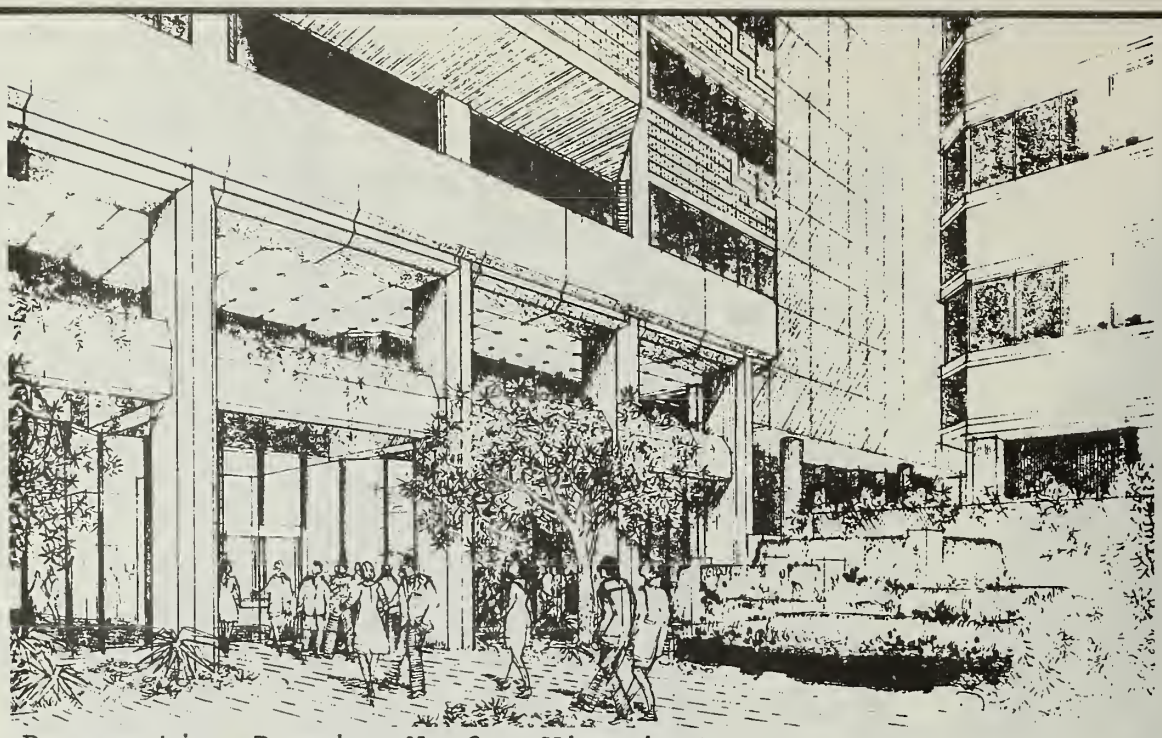
Figure No. 3



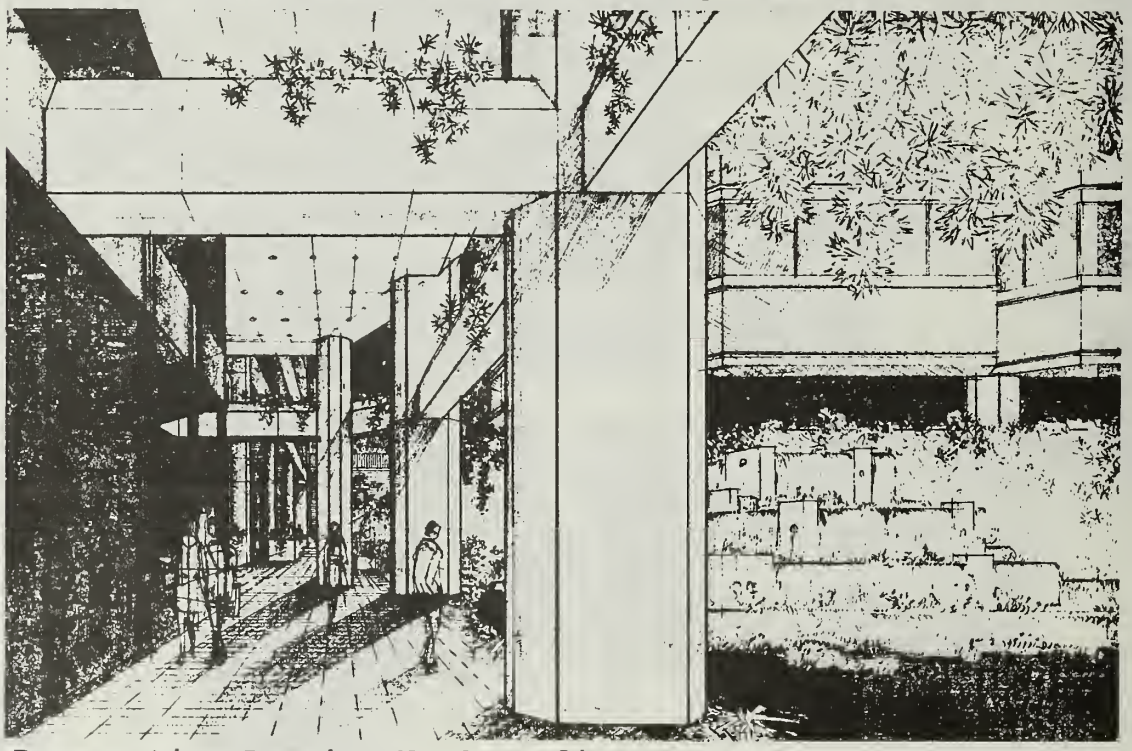
Perspective Drawing No.1. View is to West from Pedestrian Walkway extending from Spear St.

Perspective Drawing

Figure No. 4



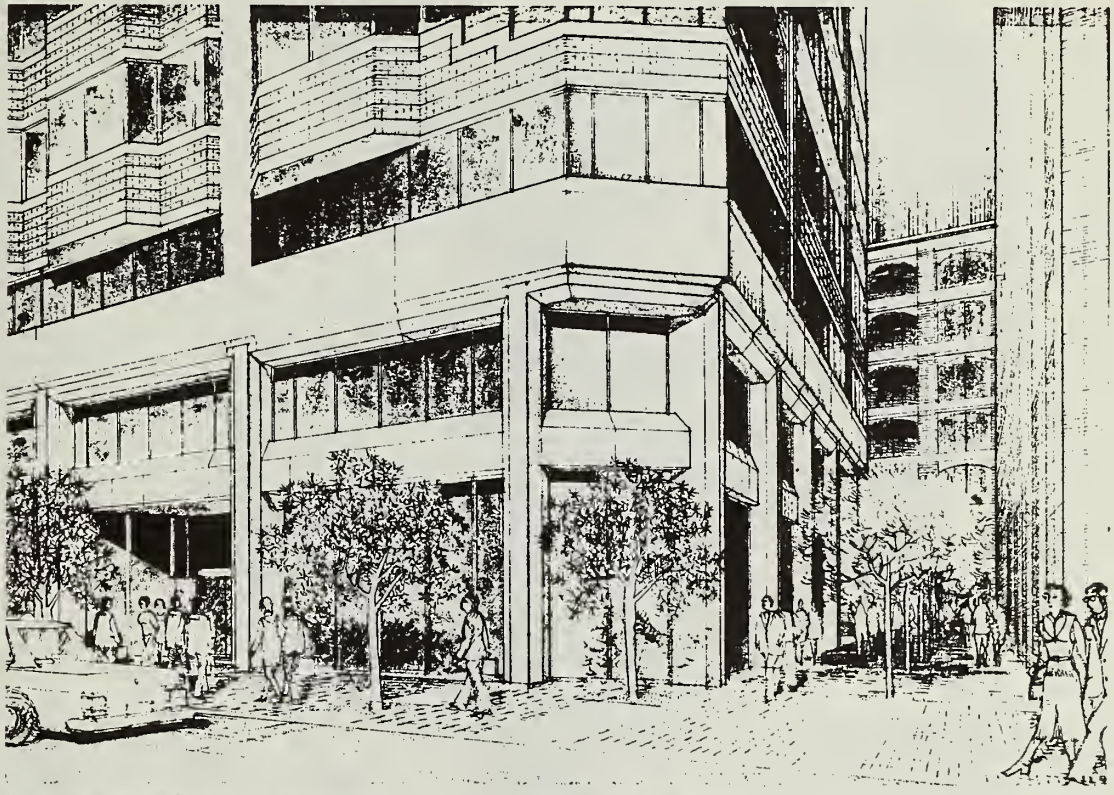
Perspective Drawing No.2. View is to the northwest from south edge of pedestrian walkway, toward east face of building base.



Perspective Drawing No.3. Adjacent east face of building base.

Perspective Drawings

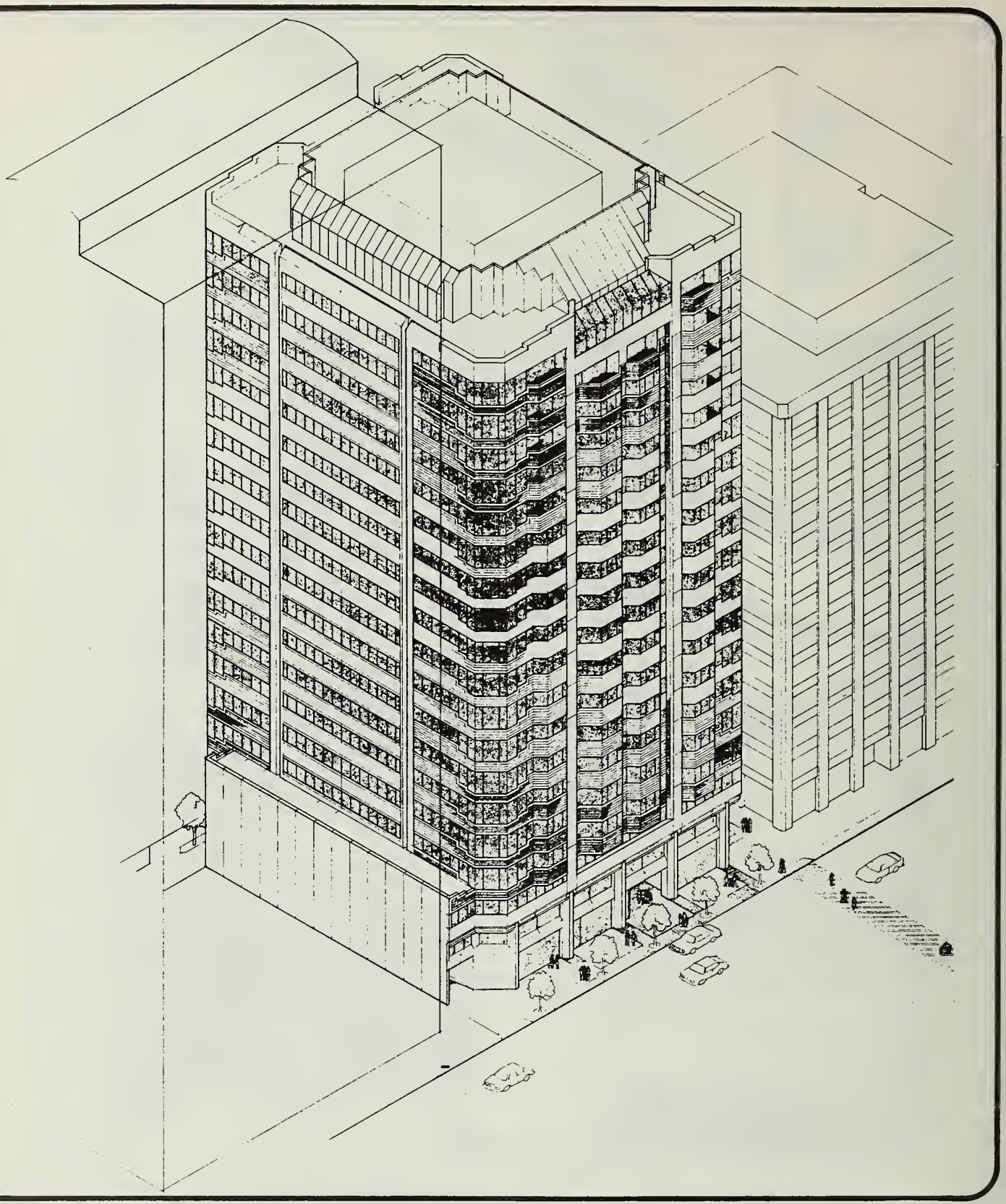
Figure No. 5



Perspective Drawing No.4. View is to east adjacent south side of building as would be seen from Main St. Howard and Spear Office Bldg. is in background.

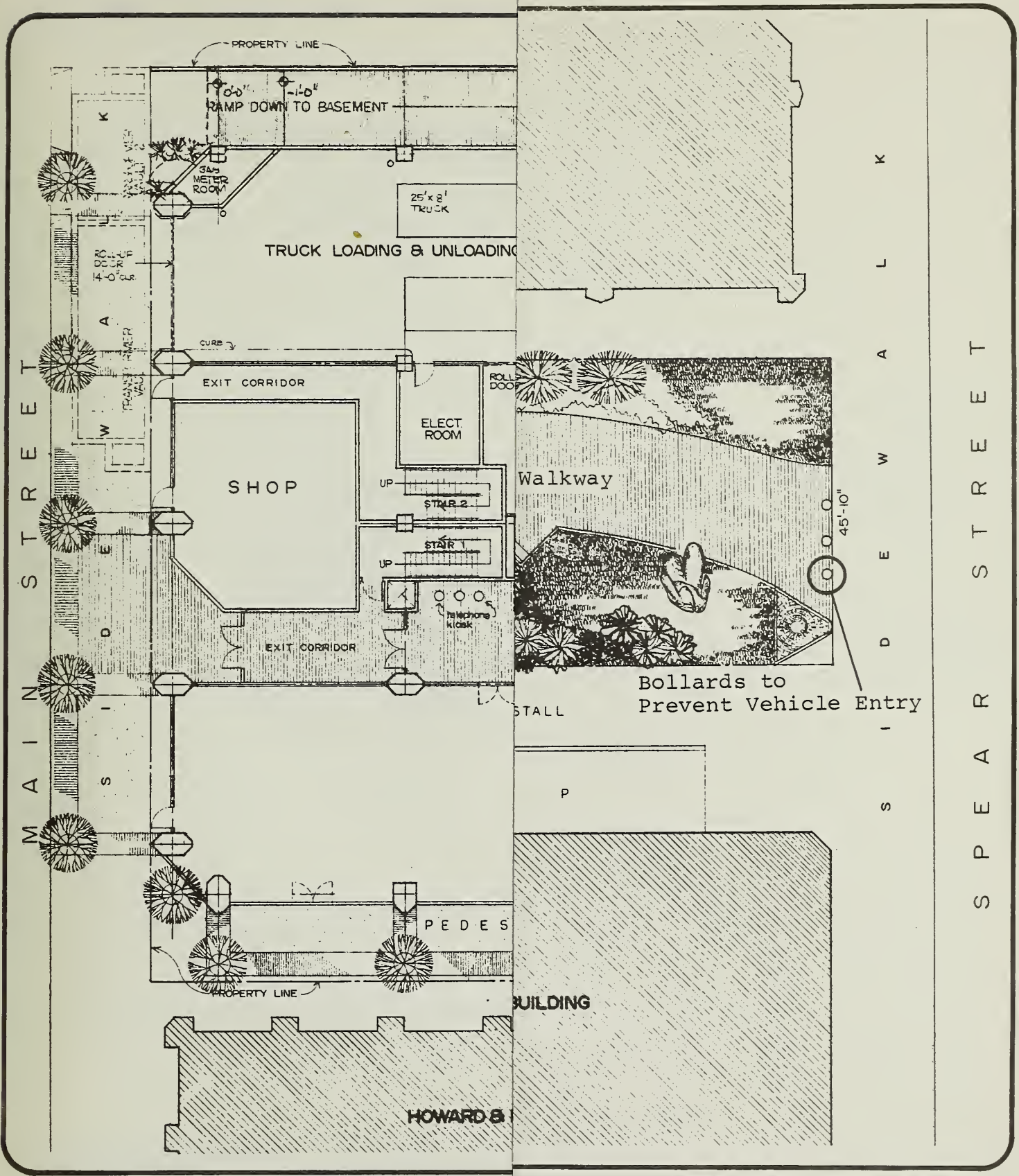
Perspective Drawing

Figure No. 6



Isometric Drawing of Proposed Project, Main Street Frontage

Figure No. 7



Ground Floor Plan

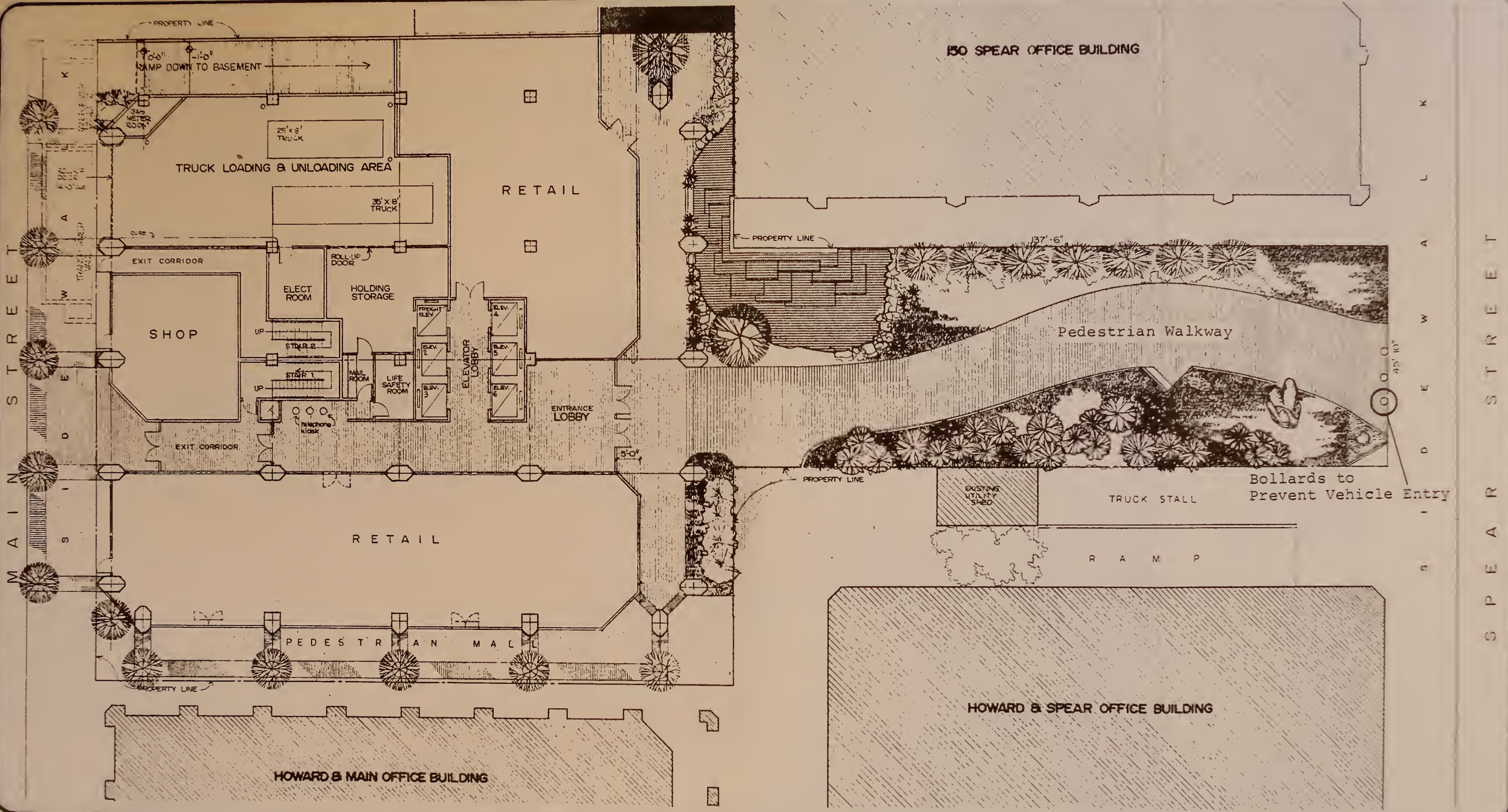
North

0 10 20 40

Scale Feet

Source: Jorge De Quesada, Inc., A

Figure No. 8



Ground Floor Plan

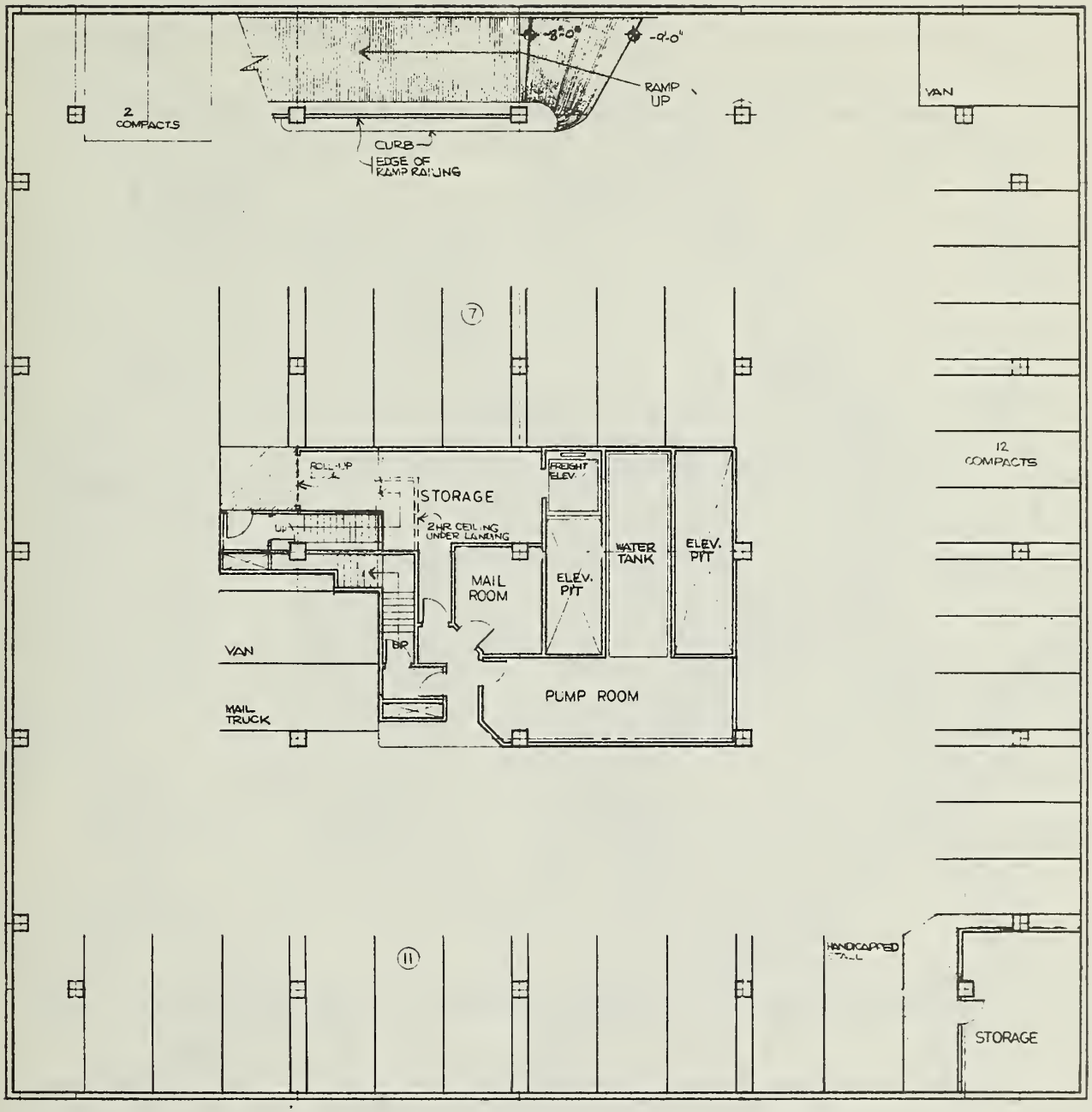
Source: Jorge De Quesada, Inc., Architects

North

0 10 20 40

Scale Feet

Figure No. 8



Basement Floor Plan

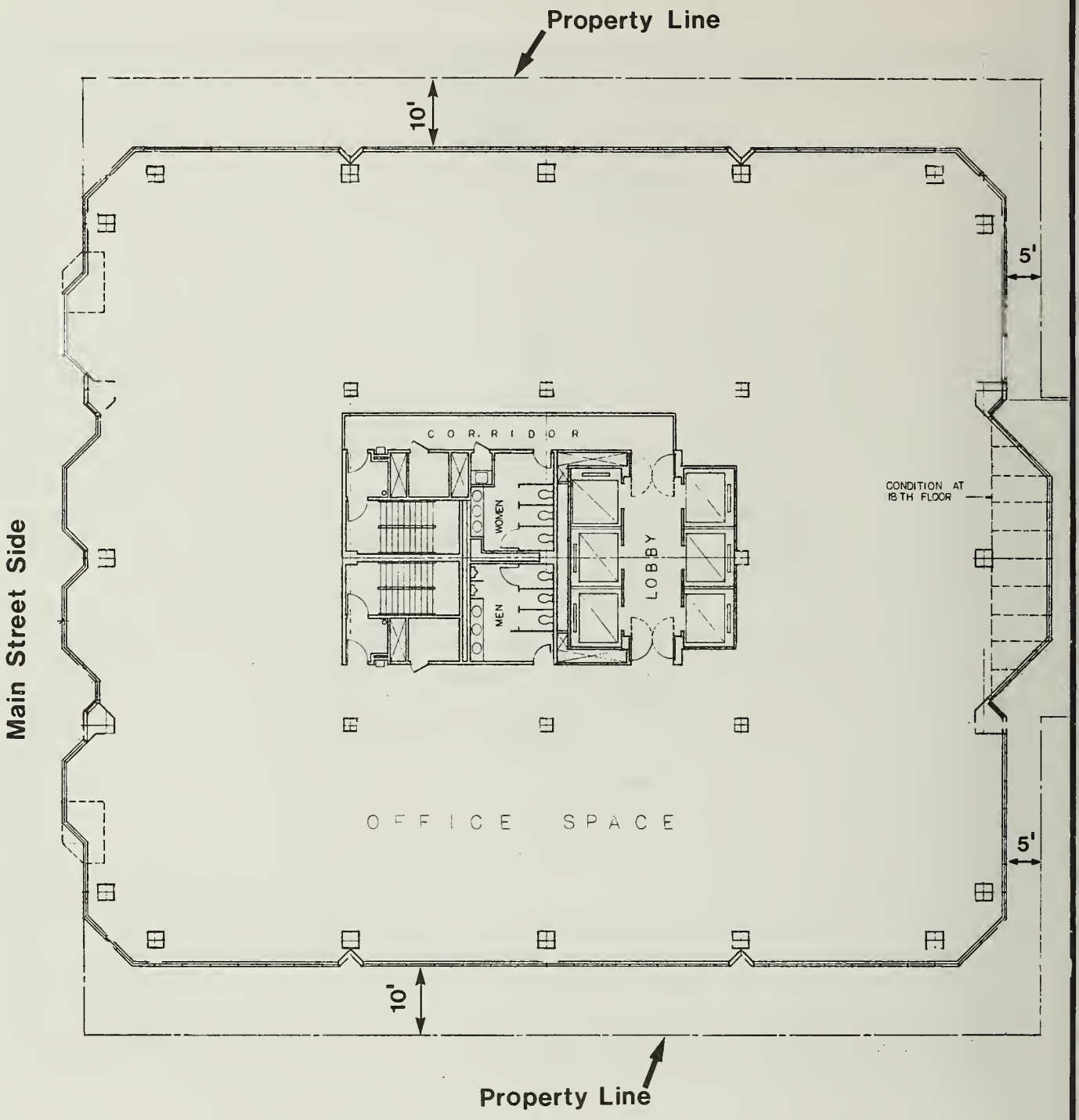
North

0 10 20 40

Scale Feet

Source: Jorge De Quesada, Inc., Architects

Figure No. 9



Typical Floor Plan

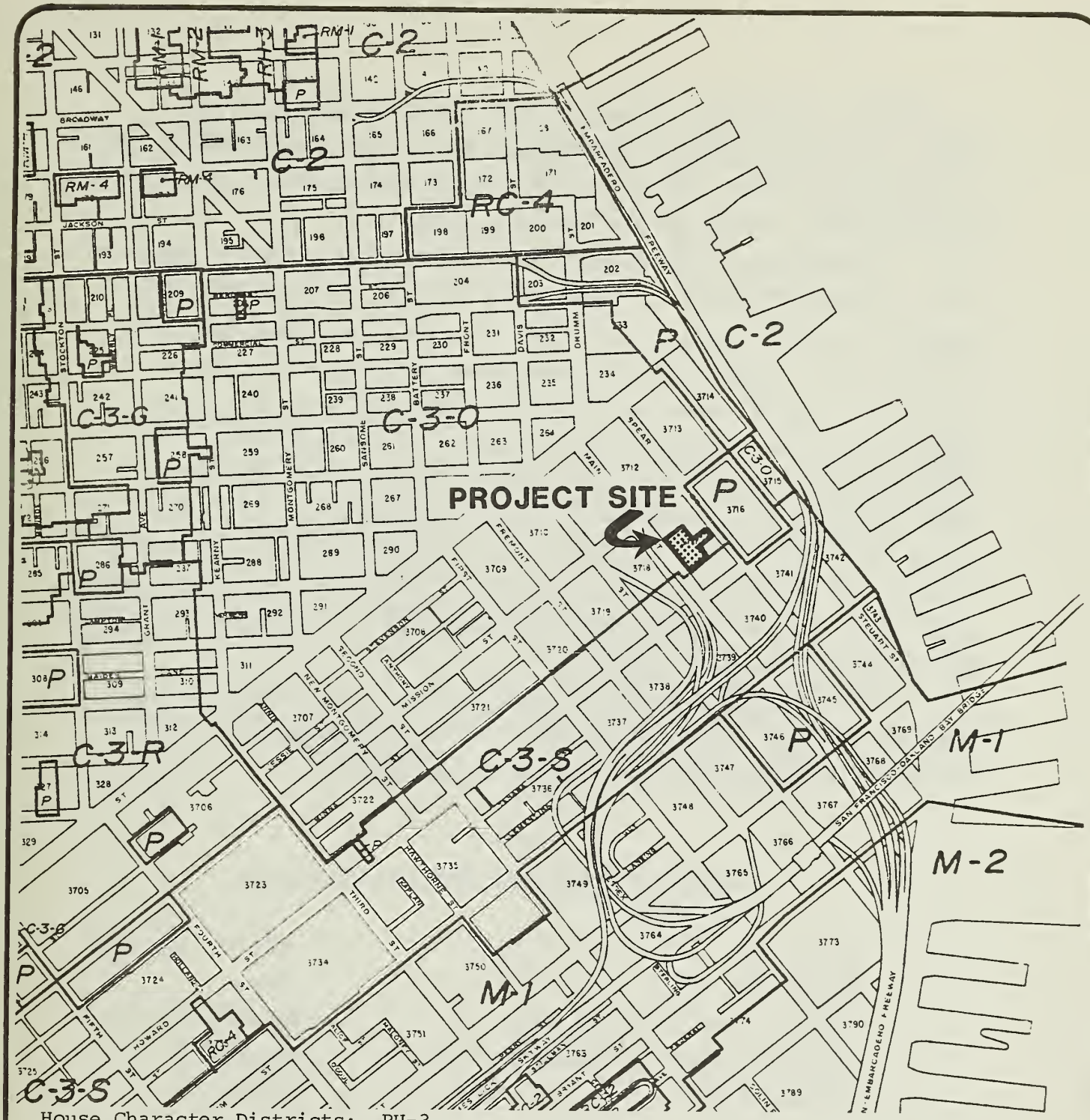
North

0 10 20 40

Scale Feet

Source: Jorge De Quesada, Inc., Architects

Figure No. 10



House Character Districts; RH-3
Mixed House & Apartment Character Districts; RM-1, RM-2, RM-3, RM-4
Residential-Commercial Combined Districts; RC-2, RC-3, RC-4
Commercial Districts; C-2, C-3-O, C-3-R, C-3-G, C-3-S, C-M
Industrial Districts; M-1, M-2
Public District; P

Zoning Map

Source: City and County of San Francisco, Zoning Maps

North

0 400 800 1600

Scale Feet

Figure No.11

of assembly and entertainment, dwellings, group housing, motels, hotels, schools and laundries are permitted uses. Up to 1 dwelling unit for every 125 square feet of lot area (202 on the project site) would be permitted.

The basic floor area ratio (FAR) allowable in the C-3-O district is 14:1. Thus any building on the site may contain a total gross floor area of up to 14 times the area of the lot.[1] This FAR is the maximum permitted for the office and retail uses on the site under interim controls approved by the Board of Supervisors.[2] The controls temporarily limit current provisions of the City Planning Code allowing the granting of floor area bonuses for non-residential uses for the addition of such amenities as rapid transit access, multiple building entrances, plazas and setbacks and, thus, an increased FAR. Accordingly, no bonuses are being sought by the project sponsor.

The proposed project would have a total gross floor area of 306,500 square feet and, thus, an approximate FAR of 12:1. Calculations are indicated in Table 1.

TABLE 1

Square Footage and FAR Calculations

Site Area	25,208 sq. ft.
Basic FAR	14:1
Basic Allowable Area	352,912 sq. ft.
Gross Area of Proposed Building	306,500
Proposed FAR	12.2:1

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[1]For the purposes of floor area ratio calculations the site is made up of the combined area of lots 5, 10 and 11 of Assessor's Block 3717. (The technical definition of lot appears in Section 102.12 of the City and County of San Francisco Planning Code.)

[2]City Ordinance 240-80, effective 1 July 1980. See Section VI. Alternatives, page 122, for a discussion of construction on the project site without interim bonus controls.

The height and bulk district for the site is 240-G. This allows a maximum building height of up to 240 feet, with a maximum building length of 170 feet and a maximum diagonal dimension of 200 feet above a height of 80 feet. The proposed building would be 240 feet in height and have a maximum length of 140.5 feet and a diagonal dimension of 168 feet above a height of 80 feet.

D. REQUIRED APPROVALS

The proposed project would be subject to Discretionary Review by the City Planning Commission.[1] Evaluation criteria under this process includes the protection and enhancement of the pedestrian environment; preservation of architecturally and historically significant buildings; preservation of housing; avoidance of industrial displacement; adequate and appropriate means of transportation to and from the project site; energy conservation; physical relationship of the proposed building to its environs; and effects on views from public areas and on the City skyline.

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[1]San Francisco City Planning Commission, Resolution 8474, adopted 17 January 1980, applicable to all proposals in the C-3 district.

CHAPTER II

SETTING

A. LAND USE

The project site is on the southeastern periphery of the downtown district and to the north of the downtown service area, zoned C-3-0 (Commercial Office) and C-3-S (Commercial Support), respectively (Figure 11, page 15). While both areas are experiencing a trend towards increased office construction and general intensification of land use activity, the land use characteristics of the two areas differ.

Downtown San Francisco has approximately 43 million square feet of office space,[1] about 17 million square feet of which was constructed from 1970 to 1980. Highrise buildings now under construction have an average density of 1.5 million square feet per acre; recent highrise proposals, a density of 2.1 million square feet per acre.[2] Downtown (C-3-O) San Francisco is a major center for financial, corporate and professional activity in which physical proximity permits face-to-face business contacts to be made conveniently on foot. The increasing professional, office-administrative employment in this area has meant a change from a mixed blue and white-collar employment market to a white collar market emphasizing finances, administration and services.

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[1] 101 Montgomery Street Final EIR, EE 80.26, Certified 7 May 1981, page 185.

[2] Sedway/Cooke, Downtown San Francisco Conservation and Development Planning Program Phase I, 1979, page 7.

The downtown support (C-3-S) district contains a variety of support services, usually located in lowrise buildings constructed prior to the 1930s and 1940s. They include, but are not limited to, wholesaling, printing, dry cleaners, office supply and parking.

The proposed project site has in the past been used as a parking lot for about 145 cars with an attendant, and is now used as a construction site for storing materials and equipment for the 150 Spear Street office building (EE78.413). The land use mix of Assessor's Block 3717, in which the site is located, and the general site area are the result of construction trends in the South of Market C-3-0 and C-3-S areas. For example, the block is occupied by several pre-1930 brick buildings (Chapter II.G., Historical Resources, page 46), with frontages on Spear Street, Mission Street and Main Street. Uses within the block include a ship chandlery proposed for removal and construction of a 21-story office building (101 Mission Street Office Building, EE79.236, Figure 18, page 43), a liquor store, printing company, restaurants, warehouse and office space. The 8-story Borel office building (Figure 19, page 44) and 13-story Howard and Main office building along Howard Street were constructed in the 1970s. The 18-story 150 Spear Street office building (EE78.413) is adjacent to the project site fronting Spear Street and is currently under construction, as noted above. Two other buildings proposed for the block include the 24-story 115-135 Main Street office building (EE 81.61) adjacent the north property line of the project site which would replace the printing company, and the 27-story Mission and Main Street office building (81.183E) at the corner of Main and Mission Streets which would replace retail businesses.

Within the surrounding area, other recent major developments include the 30-story Pacific Gateway project (EE78.207) now under construction, the 21-story 315 Howard Street office building (EE79.196) approved for construction on 13 November 1980 by the Planning Commission, and the proposed 18-story 201 Spear

Street office building for which an EIR is currently being prepared (EE80.337). The 201 Spear Street office building would be located at the southeast corner of the intersection of Howard and Spear Streets. Figures 12 and 13, pages 21 and 22, show the location of these projects and land use activities.

B. TRANSPORTATION

1. Street System

The street network and freeway ramp accessibility for the project area are depicted in Figure 14, page 23.

The project site generally has freeway accessibility to and from the East Bay and Peninsula. The most direct freeway access is at the on and off-ramps at the Mission/Beale Street and Mission/Main Street intersections (approximately 400 feet from the project site). Additional ramps are available along Fremont and Harrison Streets (within one/half mile of the project site). Automobile accessibility to and from the north bay is less direct and therefore subject to a more dispersed travel pattern. The most likely options for north bay travel are via The Embarcadero (to Broadway, Bay Street, etc.) or via Interstate 80 to U.S. Highway 101.

The street network in the project vicinity includes the east/west routes of Market, Mission, Howard and Folsom Streets and the major north/south access routes of Fremont, Beale and Main Streets and The Embarcadero. The Transportation Element of the San Francisco Comprehensive Plan designates Market, Howard, Folsom, Beale, Main and Steuart Streets and The Embarcadero as major thoroughfares.[1] The Transportation

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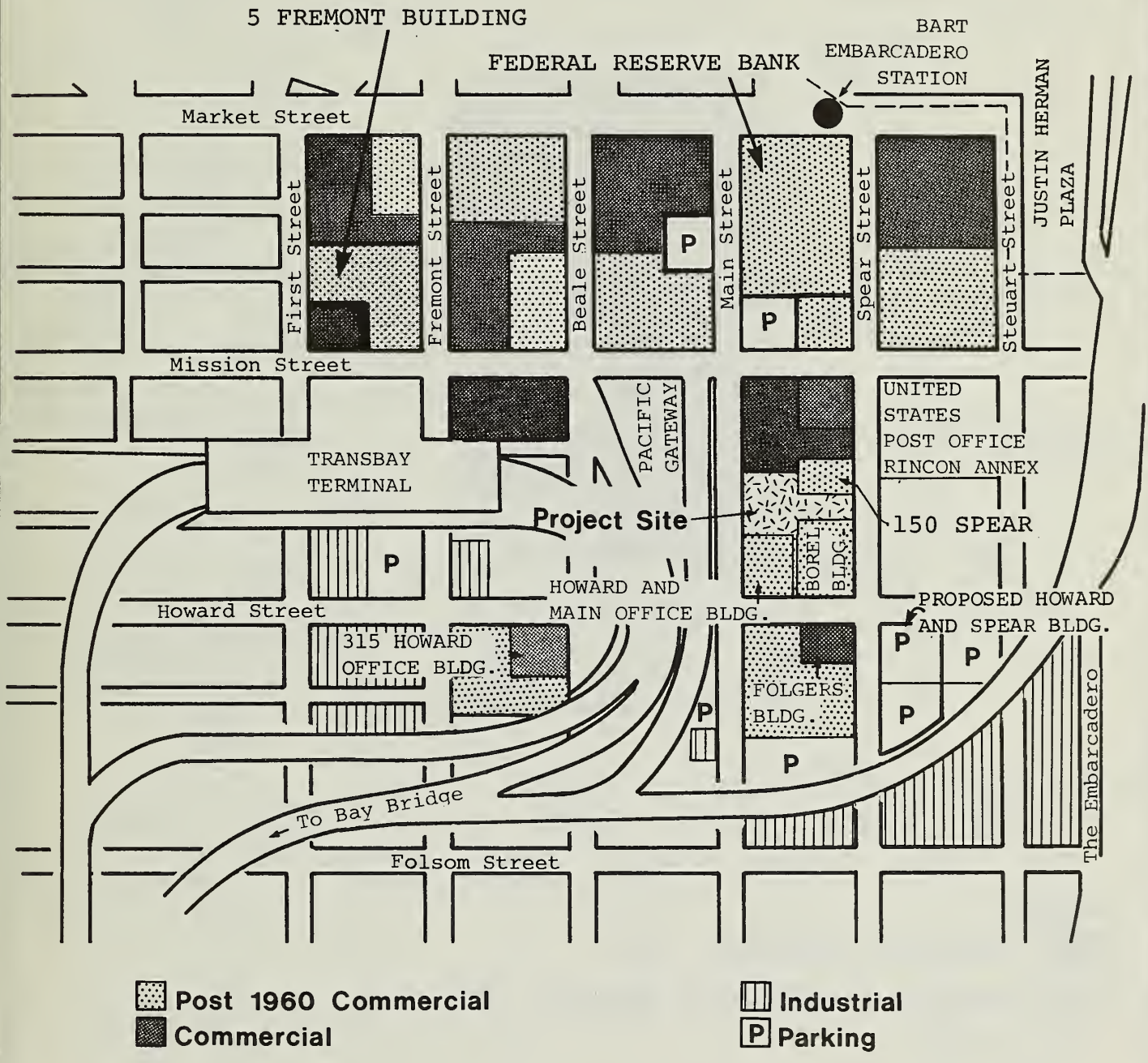
[1]Major thoroughfare is defined as ". . . a cross-town thoroughfare whose primary function is to link districts within the City and to distribute traffic from and to the freeways, a route generally of city-wide significance . . ."



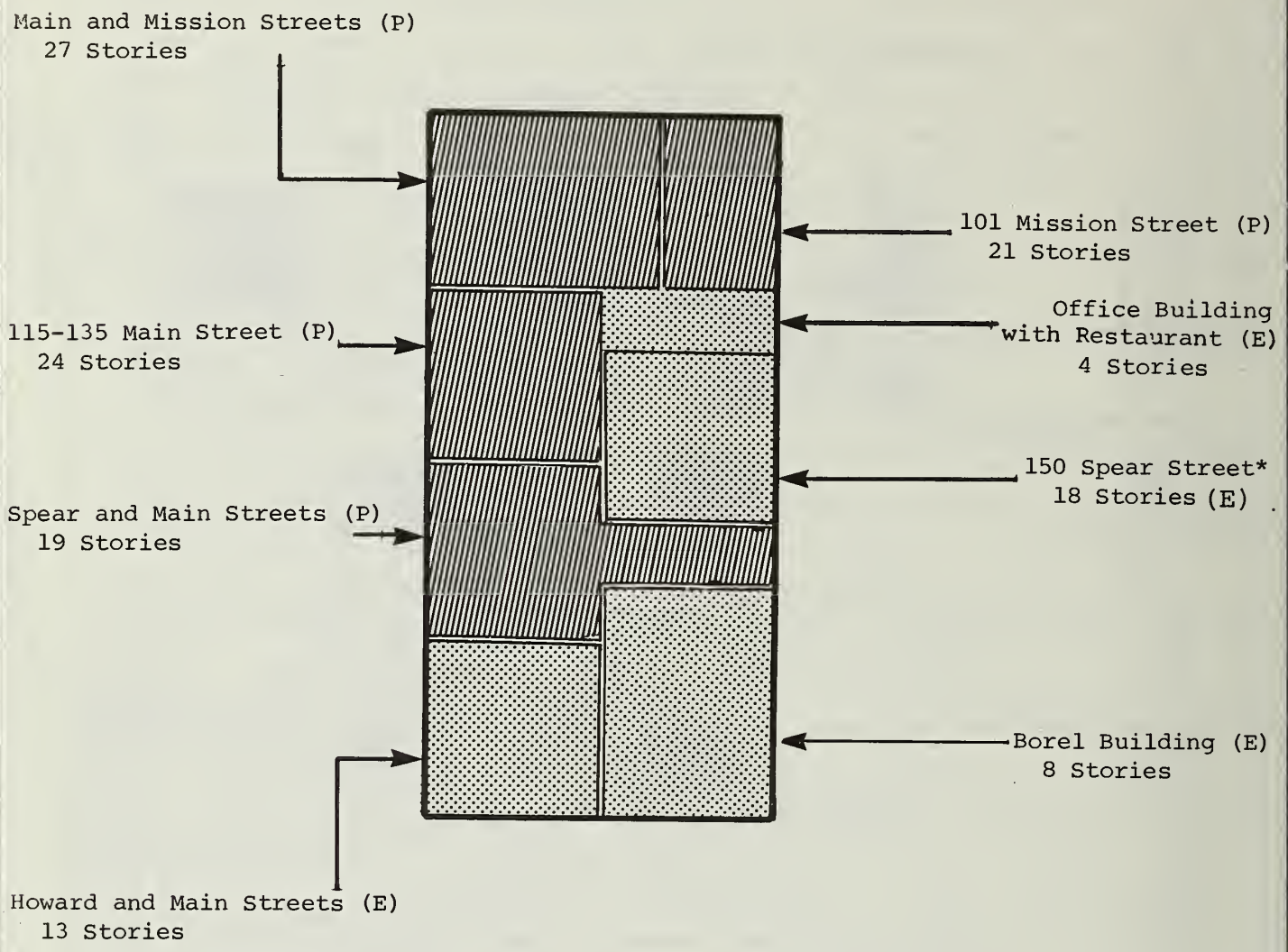
Land Use Map

(See Figure 12 for a detailed map of existing and proposed buildings on the project block)

North
Not to Scale

Source: Field Check by EIP Corp.

Figure No. 12



Legend

Proposed building (P)

Existing building to remain (E)

*Under construction

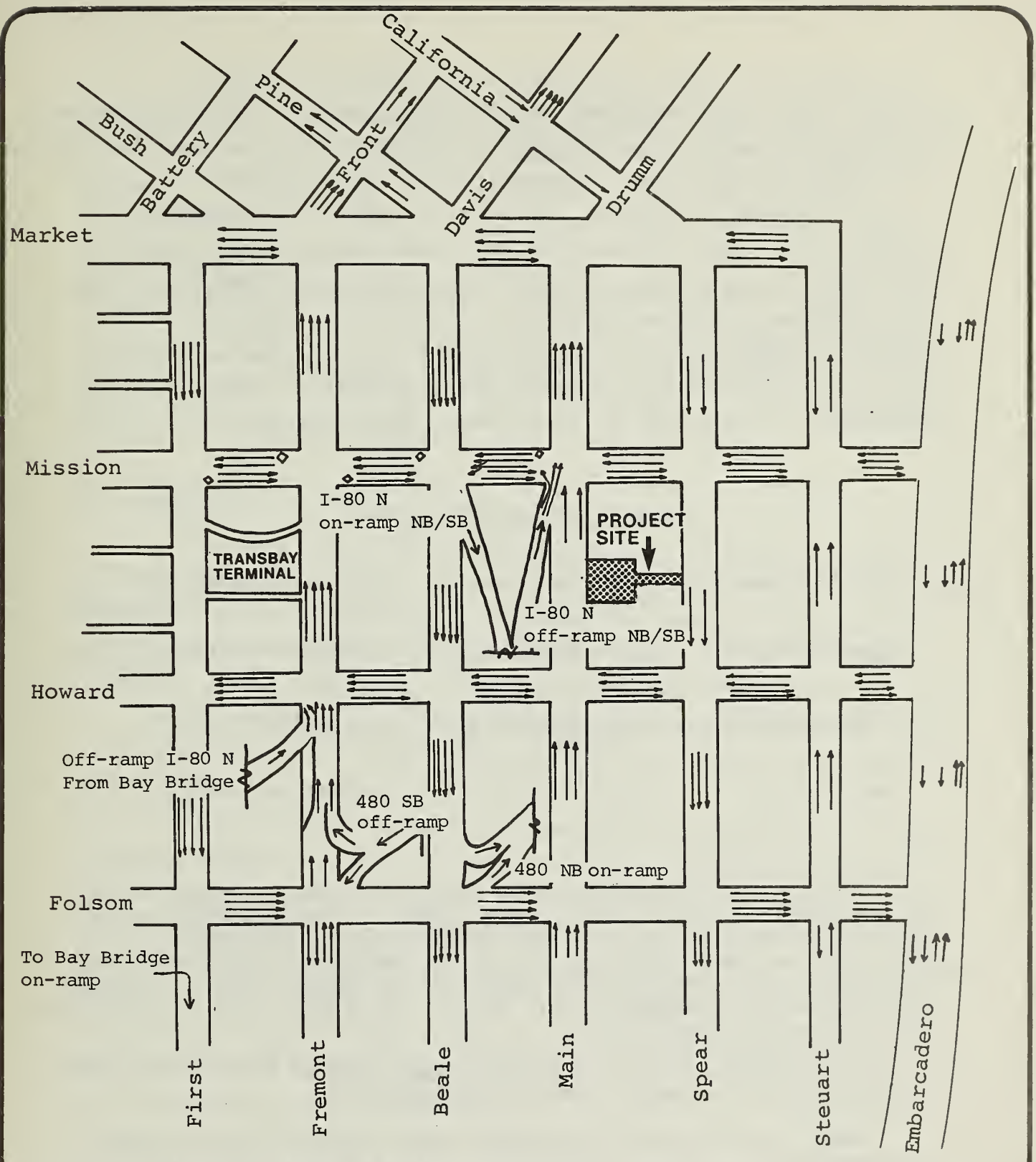
(Note: only existing buildings to remain are shown.)

Existing (E) and Proposed (P) Buildings on Block 3717

North
Not to Scale

Figure No. 13

Source: EIP Corporation



Source: Field observations by EIP Corp.

Street Network

Note: Turning movements shown in Appendix A, pages A-1 - A-4.

North

Legend:

◇ Diamond Lane: Buses and Right Turns Only, 7am to 6pm

NB = Northbound

SB = Southbound

⟶ = Traffic Lane

Not To Scale

Figure No. 14

Element also designates Market, Mission, Fremont and First Streets as "Transit Preferential Streets." By definition, priority is given to transit vehicles over automobiles on these streets.

Because a specific analysis of traffic flow quality examines the peak traffic flow at signalized intersections, peak hour turning movement counts have been obtained[1] for 4 key intersections near the project site. Using a "critical movement analysis"[2] the service levels of the intersections have been calculated as follows (see Appendix A, page A-1, for calculation sheets and service level definitions).

Service Level Definitions

Mission/Spear	(p.m. peak hour)	- Service Level A
Mission/Main	(a.m. peak hour)[3]	- Service Level B
Mission/Beale	(p.m. peak hour)	- Service Level C
Main/Howard	(p.m. peak hour)	- Service Level A

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[1]Counts at Mission/Main and Mission/Beale conducted by Traffic Engineering Division, S.F. Dept. of Public Works on 30 April 1981 and 2 February 1981, respectively. Counts at Mission/Spear obtained from EIR for proposed 101 Mission Office Building Project (EE 79.236, certified 27 August 1981). Counts at Main/Howard conducted on 30 October 1980 as a part of this EIR (see Appendix A, page A-1).

[2]"Critical Movement Analysis" described in Circular No. 212, Transportation Research Board, January 1980.

[3]The a.m. peak hour represents peak traffic flow at this intersection.

Because traffic flows during the peak 15 minutes are 10-15% higher (than average flows throughout the peak hour) the intersections of Mission/Main, Mission/Beale and Main/Howard operate approximately 1 service level lower during peak 15-minute periods. While these service levels indicate stable traffic flow conditions, a key constraint on vehicle access is the downtown freeway network. The Interstate 80 freeway is currently operating at jammed conditions (typified by Service Level F) during the evening peak hour.[1] Thus, the overall congestion on the freeway can affect the flow on specific freeway links or individual ramps.

2. Transit

The project site is accessible via a number of public transit services. Local routes are provided by the San Francisco Municipal Railway (MUNI) and regional service is available via BART, A.C. Transit (AC), Golden Gate Transit (GGT), San Mateo County Transit (SamTrans), Greyhound, and Southern Pacific (SP).

San Francisco Municipal Railway. Muni operates a total of 38 routes within walking distance (2,000 feet) of the project site (Table 2, page 26).

City staff have provided patronage statistics for most downtown routes, projected to 1983. The projections include existing patronage as well as increased patronage attributed to other committed development in the downtown area. In Table 3, page 28, the p.m. peak hour patronage, capacity and load factors[2] are shown for the lines. As the table indicates, a number of lines would operate over capacity in 1983. Because capacity is based upon 150% of the available seats, any load-factor over 1.00 reflects crowded conditions.

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[1]City and County of San Francisco, Department of City Planning, Final Environmental Impact Report for Proposed Pacific Gateway Office Building Project (EE78.61), certified 26 July 1979.

[2]"Load factor" is defined as the patronage divided by the maximum capacity.

TABLE 2

MUNI SERVICE SUMMARY

ROUTE DESIGNATION	
1 - California	Service linking downtown with Western Addition and Richmond
1X - California Express	Service linking downtown with Richmond, weekday peak hour only
2 - Clement	Service linking downtown with Western Addition and Richmond
3 - Jackson	Service linking downtown with Pacific Heights and Western Addition
4 - Sutter	Service linking downtown with Western Addition, peak hour only
5 - Fulton	Service linking Transbay Terminal and downtown with Richmond
6 - Parnassus	Service linking Transbay Terminal and downtown with Sunset
7 - Haight	Service linking downtown with Haight-Ashbury, weekdays only
8 - Market	Service linking downtown with Mission
9 - Richland	Weekday service linking downtown with Mission and Bernal Heights
11 - Hoffman	Service linking downtown with Upper Market and West Portal
12 - Ocean	Service linking downtown with Outer Mission and City College
14 - Mission	Service linking downtown with Mission, Outer Mission, and Daly City
14GL & 14X - Mission	Express and limited-stop service linking downtown with outer Mission and Daly City

TABLE 2 (cont'd)

15 - Third	Service linking Wharf, downtown, Bayview and City College
21 - Hayes	Service linking downtown with Richmond
27 - Noe	Service linking downtown with Mission and upper Noe Valley
31 - Balboa	Service linking downtown with Richmond
31X - Balboa Express	Express service linking downtown with Richmond
32 - The Embarcadero	Daytime service linking South of Market and downtown with Aquatic Park
38 - Geary	Service linking Transbay Terminal and downtown with Western Addition and Richmond
38L, 38AX & 38BX - Geary	Express and limited-stop service linking downtown with Richmond
40X - Commuter	Express service linking S.P. Depot with South of Market area.
41 - Union	Service linking Mission with downtown, Chinatown and North Beach
42 - Downtown Loop	Service linking downtown with S. P. Depot, Civic Center and Fisherman's Wharf
55 - Sacramento	Service linking downtown with Western Addition
61 -	California Cable Car
71 - Haight-Noriega	Service linking downtown with Haight and Sunset (during weekday peak periods only)
72 - Haight-Sunset	Service linking downtown with Haight, Sunset and Stonestown (during weekday peak periods only)
80X Gateway Express	Service linking Gateway Center with downtown and S. P. Depot
J, K, L, M, and N MUNI METRO	Light-rail service linking downtown with Upper Noe, Sunset, Parkside and Ingleside districts

TABLE 3

PROJECTED 1983 MUNI PATRONAGE[1]

(PM Peak Hour - Outbound Direction)

LINE	CAPACITY[2]	PATRONAGE	PROJECTED[3] LOAD FACTOR
1	450	499	1.11
1X	750	766	1.02
2	600	716	1.19
3	525	638	1.21
4	375	294	.79
5	1,275	1,233	.97
6	675	627	.92
7	450	410	.91
8	1,125	823	.73
9	750	663	.88
11	750	844	1.13
12	525	609	1.16
14	1,275	1,521	1.19
14GL	300	317	1.06
14X	675	819	1.21
15	975	1,108	1.14
21	825	827	1.00
27	300	196	.65
31	525	626	1.19
31X	675	713	1.06
32	1,050	520	.50
38	1,125	1,236	1.10
38L	675	819	1.21
38AX	600	631	1.05
38BX	300	242	.81
40X	525	403	.77
41	No Statistics Available		
42	300	289	.96
55	1,650	1,821	1.10
61	No Statistics Available		
71	375	232	.62
72	300	346	1.15
80X	600	542	.90
J	1,235	998	.81
K	3,900	3,901	1.00
L	No Statistics Available		
M	No Statistics Available		
N	2,400	2,565	1.07

Source: Guideline for Environmental Evaluation - Transportation Impacts, San Francisco Dept. of City Planning, 3 July 1980, revised October 1980.

[1]Statistics are not available for all of the routes listed in Table 3. Load factors shown above are for the peak hour; certain peak runs may actually have higher load factors.

[2]Capacity = 150% of available seats.

[3]Load Factor = Ratio of patronage to maximum capacity.

BART. BART staff[1] has provided the following p.m. peak hour operating statistics for outbound trains at their peak load points:

	East Bay[2]	Daly City
Seats	9,000	6,400
Passengers	11,646	6,408
Average load factor	1.29	1.00

With heavier ridership during portions of the peak hour, certain peak trains experience load factors which are approximately 10% higher.

AC Transit.[3] AC Transit operates approximately 200 buses outbound from the Transbay Terminal during the p.m. peak hour. Based on a capacity of 125% of vehicle seating (AC policy accepts 25% standees) and an average of 50 seats per bus, a total capacity of 12,500 passengers is available. With a current peak hour patronage of 9,000 during the peak hour, the overall capacity reserve is 3,500. However, certain peak runs have higher load factors and therefore little excess capacity.

Golden Gate Transit.[4] Golden Gate Transit operates 147 buses out of the downtown area during the afternoon peak hour, about 120 buses on the financial district routes and

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[1]John Stamas, BART Planning Staff, personal communication, 5 February 1981.

[2]Includes direct service to Richmond.

[3]Gene Gardiner, Assistant Manager, Division of Planning and Research, AC Transit, telephone conversation, 27 March 1981.

[4]Alan Zahradnik, Golden Gate Transit Planning Staff, telephone conversation, 27 March 1981.

27 buses on the Civic Center routes. On the average, these buses run at their design capacity level as set by Golden Gate policy, i.e., at seating capacity. Golden Gate Transit allows a maximum capacity of 55 passengers per bus, (45 seats plus 10 standees) which equates to 8,085 peak hour riders. Current peak-hour ridership out of downtown is estimated at 6,620 passengers. It should be noted that on certain peak runs, more than 10 standees may be present.

SamTrans and Southern Pacific.[1] There are currently 12 SamTrans buses leaving the downtown area during the afternoon peak hour. The buses operate at about 90% of seating capacity, corresponding to peak-hour ridership of about 510 passengers. With 25% standees acceptable to SamTrans, it is estimated that there is a reserve capacity for 240 passengers. SamTrans staff projects that this reserve capacity will be used up by 1982.

The SP commute service has recently been incorporated into an operating agreement between the railroad and the State of California (through CalTrans). Current service provides 11 southbound trains with 9,000 seats during the p.m. peak hour. The current load factor (based upon one seat per passenger) is 0.83, or approximately 7,470 passengers.

3. Parking

The proposed project site is within the "Downtown Core Automobile Control Area" as designated in the San Francisco Master Plan.[2] Essentially, the goal for this area is to limit parking and thereby reduce the intrusion of automobile travel. South of the proposed site is a parking belt area, also designated

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[1]SamTrans data based on telephone conversation with Larry Stueck, SamTrans staff, 27 March 1981. Southern Pacific data based on telephone conversation with John Lai, CalTrans staff, 27 March 1981.

[2]City and County of San Francisco, "Revisions to the Transportation Element of the Master Plan Regarding Parking," 20 January 1977.

in the City's Master Plan. This belt is defined as an area "within the Downtown Commercial District which may be appropriate for new short-term parking facilities subject to criteria of Citywide Parking Plan."

A number of parking occupancy studies have been conducted in this area. As part of the EIR on the 5 Fremont Center Project (EE80.268),[1] parking surveys were conducted (in mid-1980) in the area bounded by The Embarcadero, Harrison Street, Third Street, Kearny Street and Washington Street. Within this area a total of 15,020 long-term (greater than 6 hours) off-street spaces are available and the average occupancy is approximately 89%. Two other recent EIR documents contained similar parking inventory and occupancy surveys in the same basic area south of Market Street. In the EIR for the Pacific Gateway Office Building Project,[2] off-street spaces were found to have an occupancy rate of 90-100%, while on-street spaces were observed to have an occupancy rate of 85-95%. The EIR for the 315 Howard project[3] found 90% occupancy rates for both the off-street and on-street spaces surveyed. The consensus of the various surveys is that on and off-street parking is nearly fully utilized during the day.

On-street truck loading zones are available (in close proximity to the project site) on Main and Spear Streets. Based upon field observations,[4] these zones have space available for 1-2 vehicles during the a.m. peak period (7-9 a.m.). During the midday (11:30 a.m.-1:30 p.m.) and p.m. (4-6 p.m.) peak periods,

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[1]San Francisco Department of City Planning, Final Environmental Impact Report, 5 Fremont Center (EE80.268), certified 12 March 1981.

[2]San Francisco Department of City Planning, Final Environmental Impact Report, Pacific Gateway Office Building Project (EE78.61), certified 26 July 1979.

[3]San Francisco Department of City Planning, Final Environmental Impact Report, 315 Howard Street Office Building, (EE79.196), certified 21 August 1980.

[4]Field observations by EIP Corporation, 27 and 30 October 1980.

the zones were fully occupied. However, the majority of the vehicles occupying these zones appear to be passenger cars which are illegally parked. Delivery vehicles were observed "double parking" during midday and p.m. peak periods.

4. Pedestrian and Bicycle Access

Pedestrian Conditions. Pedestrian volumes on adjacent sidewalks and crosswalks were counted during both the midday (11:30 a.m. - 1:30 p.m.) and evening (4:00 p.m. - 6:00 p.m.) peak periods.[1] The physical conditions, average flows during these periods and peak 15-minute flow rates are depicted in Figure 15, page 33.

Department of City Planning[2] staff has determined that an accepted methodology for describing pedestrian flow quality is contained in Urban Space for Pedestrians by Pushkarev and Zupan.[3] This source cites the following characteristics of pedestrian flow:

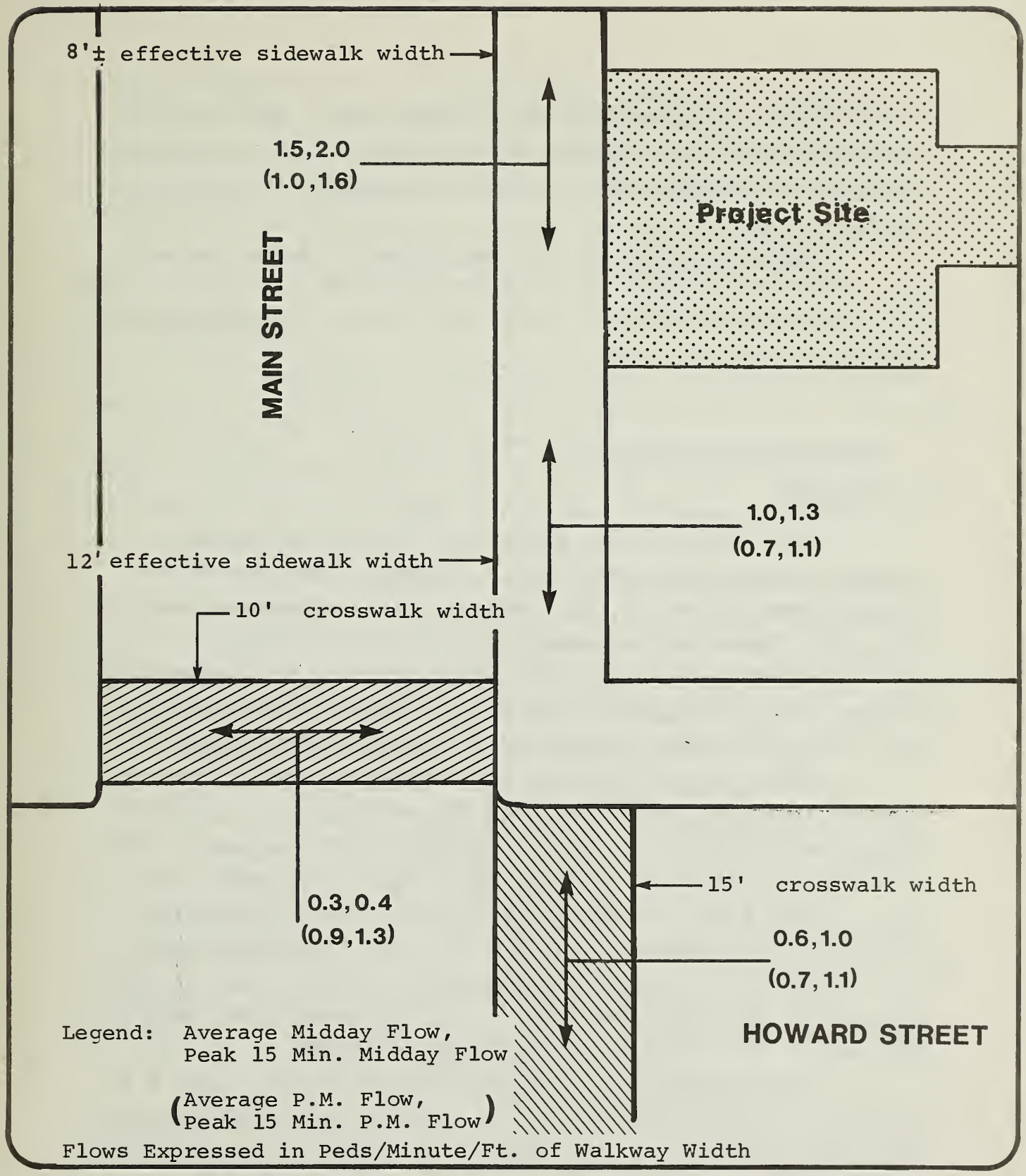
Description	Flow Rate (persons/minute/foot of walkway width)
Open	less than 0.5
Unimpeded	0.5 - 2
Impeded	2 - 6
Constrained	6 -10
Crowded	10 -14
Congested	greater than 14

The existing pedestrian flows are generally in the unimpeded range although the Main Street sidewalk north of the

[1]Counts conducted by EIP Corporation, 30 October 1980.

[2]San Francisco Department of City Planning, "Guidelines for Environmental Evaluation - Transportation Impacts;" June 1980, revised October 1980.

[3]Pushkarev and Zupan, Urban Space for Pedestrian, MIT Press, 1975.



Existing Pedestrian Conditions

North
Not to Scale

Source: Field observations by EIP Corp.

Figure No. 15

project site is approaching the impeded range. The degraded pedestrian conditions in this area are due to the encroachment of planters, parked cars, etc., which reduce the effective sidewalk width.

Bicycle Conditions. In the vicinity of the project site, the City's Master Plan has designated Market Street, Spear Street and The Embarcadero (from Spear Street to Berry Street) as bicycle routes.

C. CLIMATE AND AIR QUALITY

1. Climate

The climate of San Francisco is dominated by the breezes characteristic of a marine climate. Because of the steady stream of marine air, there are few extremes of heat and cold. Temperatures exceed 90 degrees Fahrenheit an average of once a year and drop below freezing an average of less than once a year. The warmest month is September, with an average daily maximum of 68 degrees Fahrenheit.

Winds in San Francisco are generally from a westerly direction and are persistent from May to August. During the rainy season (October to April), however, the strongest winds flow from the south as well as from the west and northwest.

Wind tunnel tests of the project site as it exists (see Appendix B, page A-7) showed that the site has low winds for northwest and west wind directions. The site is generally downward of the Financial District and Market Street highrise area and is sheltered by these upward buildings.

Existing sun and shade patterns for 8 a.m., 1:00 p.m. and 4 p.m. on the first day of each season were prepared (see Appendix B, page A-7). During winter, shadows resulting from the project and other structures are long and pedestrian areas adjacent the project block are shaded along Spear Street, Main Street and Mission Street. A similar

pattern was found for spring and fall, but project shadows did not extend across Spear or Mission Streets as far as during the winter, except at the Mission/Spear Street intersection. In summer, shadows would affect portions of the sidewalks along Mission Street and Spear Street, but do not extend across these streets at 1 p.m.

2. Air Quality

San Francisco's persistent summer wind and its upwind position in relation to major pollutant sources give it possibly the cleanest air in the Bay Area. Despite these advantages, there are periods, most often in fall and winter, when the air becomes stagnant. At these times the entire Bay Area has poor air quality.

The prevailing wind pattern in the Bay Area results in a deterioration of air quality east and south of San Francisco. Table 4, page 36, shows that areas downwind of San Francisco have more severe air quality problems. The main San Francisco monitoring site is at the Bay Area Air Quality Management District offices at 939 Ellis Street, about 1½ miles west of the project site.

The data in Table 4, page 36 are representative of the project site with the exception of carbon monoxide, since carbon monoxide is influenced by local traffic. The primary source of lead and carbon monoxide is automobile exhaust. In the past, measured levels have exceeded the state and federal standards for lead in much of the Bay Area. As use of lead-free gasoline has increased, atmospheric concentrations have decreased. In 1980, no violations of either state or federal standard were recorded within the Bay Area.

While San Francisco's air quality is better than most of the Bay Area, state and federal standards are not met in the Bay Area (Table 4, page 36). As a result, an Air Quality

TABLE 4

Number of Days Selected Pollutants Exceeded State or Federal Standards, 1980[1]

Monitoring Site	Ozone[2]	Nitrogen Dioxide	Carbon Monoxide	Suspended Particulates	Sulfur Dioxide
San Francisco (23rd Street)	0.0	0	0	6	0
Redwood City	0.8	0	0	1	0
San Jose	6.2	1	15	15	0
San Rafael	0.7	0	0	1	0
Fremont	5.6	0	0	8	0
Livermore	2.2	0	-	9	0

Source: Bay Area Air Quality Management District, Air Currents, Vol. 24, No. 4, March 1981.

[1] The State standards are specific concentrations and durations of air pollutants that reflect the relationship between concentration and undesirable effects. They are target values, and no timetable exists for their attainment. The Federal primary standards represent levels of air quality necessary for protection of public health, with an adequate margin of safety. The provisions of the Clean Air Act as amended require that by December 31, 1987 the Federal standards should not be exceeded more than once per year.

[2] In early 1979 the U.S. Environmental Protection Agency adopted a new oxidant standard. The previous standard of 0.08 parts per million for all oxidizing substances was replaced by a standard of 0.12 parts per million for ozone alone, the most prevalent oxidant. The new Federal standard is based on a 3-year average, known as the Expected Annual Exceedance (EAE). An EAE of 1.0 is considered as compliance with the standard.

Maintenance Plan (AQMP) has been prepared by the Association of Bay Area Governments (ABAG) and other governmental agencies.[1]

The 1979 Air Quality Plan contains a strategy for long-term attainment and maintenance of air quality standards. The plan includes measures to reduce emissions from stationary sources and automobiles, and proposed transportation measures to reduce automobile emissions. The air quality problems addressed in the plan are photochemical oxidants, carbon monoxide, and suspended particulates.

D. NOISE

Along Main Street, the noise environment is dominated by Main Street traffic and the Main Street off-ramp from the State Route 480 freeway network. The Spear Street frontage noise environment is affected by traffic on Spear Street. To quantify the noise environment at the project site, noise measurements were made on Monday, 20 October 1980 and Tuesday, 21 October 1980 at two locations (Figure 16, page 38).

Measurement Positon No. 1 was about 40 feet east of the centerline of Main Street at about the center of the Main Street side of the project site. During the afternoon measurement, traffic on the Main Street off-ramp was light. The dominant noise sources were diesel SamTrans and Muni buses on Main Street (69 to 73 dBA), trucks on Main Street (71 dBA), and cars on Main Street.[2] A front loader at the Pacific Gateway project

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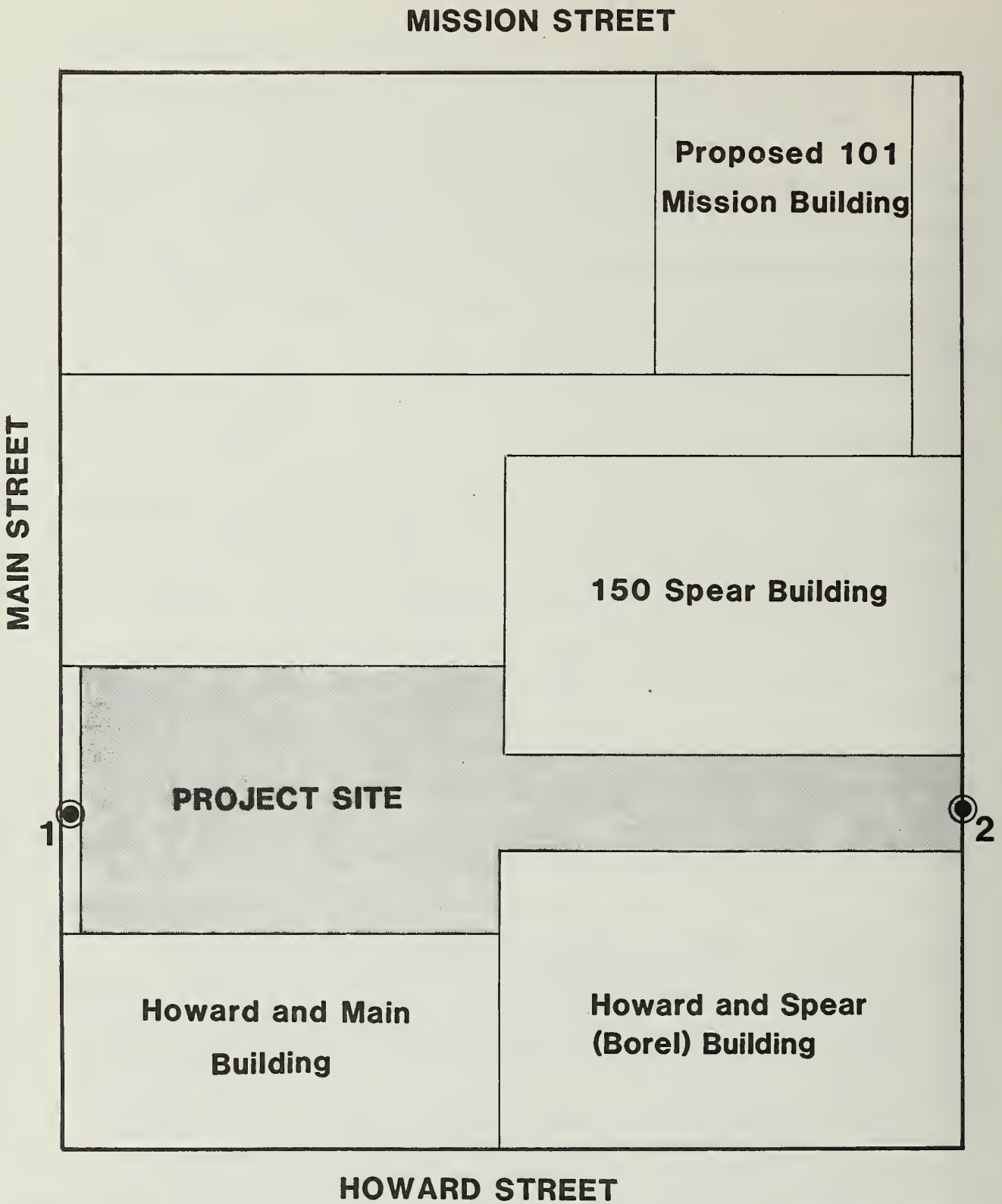
[1]Association of Bay Area Governments, 1979 Bay Area Air Quality Plan, January 1979.

[2]The decibel (db) as used in this report is the unit of sound level referenced to the sound pressure corresponding to the threshold of hearing. The A-weighted decibel (dBA) accounts for how the human ear responds to sounds of different frequencies. The equivalent sound level (Leq) is the steady A-weighted level which would generate the same acoustic energy as the time-varying environmental noise. L_{10} is the sound level exceeded 10 percent of the time. The day-night average sound level (Ldn) is a 24-hour average with 10 dBA added to the levels between 10 p.m. and 7 a.m. Refer to Appendix C, page A-19, for a discussion of the fundamentals of environmental acoustics.



Noise Measurement Locations

North

Not to Scale

Source: Charles Salter and Associates, Consultants in Acoustics

Figure No.16

site west of Main Street generated instantaneous maximum levels of 69 dBA and an emergency vehicle siren generated an instantaneous maximum level of 73 dBA as it passed Main Street on Mission.

During the morning measurement there was heavy traffic on the Main Street off-ramp; however, traffic was slow and resulting noise levels were lower than if traffic were moving at a faster rate at the measurement location. Trucks generated instantaneous maximum levels of 77 dBA on Main Street. A front loader at the Pacific Gateway construction site generated instantaneous maximum levels of 77 dBA.

Measurement Position No. 2 was on the Spear Street frontage of the project site about 40 feet west of the Spear Street centerline across from the Rincon Annex loading docks. Spear Street traffic controlled the noise environment with instantaneous maximum levels of about 67 dBA generated by motorcycles and light trucks. A helicopter flying over the site generated an instantaneous maximum level of 67 dBA. There was little activity at the Rincon Annex during the afternoon measurement. On Tuesday morning, Spear Street traffic again controlled the noise environment and a mail truck on Spear Street generated an instantaneous maximum sound level of 74 dBA. Hammering and drilling at the 150 Spear Street construction project generated sound levels of about 69 dBA. The Embarcadero Freeway traffic was noticeable in the morning and contributed to the background sound levels. The data are summarized in Table 5, page 40.

TABLE 5

15-Minute Ambient Noise Measurements (dBA)

Location No.	Date & Time	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{99}
1	20 October 1980 4:15 PM	66	72	69	64	62	61
1	21 October 1980 9:10 AM	68	77	71	66	63	61
2	20 October 1980 4:49 PM	65	70	67	64	62	61
2	21 October 1980 8:50 AM	67	72	70	67	66	65

The Transportation Noise Section of the Environmental Protection Element of the Comprehensive Plan of the City and County of San Francisco contains thoroughfare noise levels for the year 1974 (which represents existing levels). The noise levels in this document are in terms of Ldn. The Ldn along Main Street is shown to be 70 dBA. The Spear Street Ldn is not given. Analysis for the Main and Spear Street Building corroborates the Main Street Ldn since the peak-hour Leq is typically about equal to the Ldn. Based on the measured data for this project and the 101 Mission Street Building EIR (EE79.236, certified 27 August 1981), the Ldn along Spear Street adjacent to the project site is calculated to be about 70 dBA also.

E. VISUAL QUALITY AND URBAN DESIGN

The proposed project site is in an area south of Market Street that is undergoing change due to recent and current construction (Figure 17, page 41 and Chapter II.A.,

View east of project site as seen from Main Street. Rincon Annex appears in the background. Construction equipment is for the 150 Spear Street Office Building.

Project Area Photograph

Source: EIP Corporation

Figure No.17

Land Use, page 18).[1] Previously, the project area was primarily characterized by pre-1930, 2- to 3-story commercial/office buildings, while today older buildings are being removed to make way for highrise structures. Vegetation is limited to street trees and landscaped plazas associated with the highrise buildings.

The 2 to 3-story brick buildings on the block contiguous to the project site fronting Main, Mission and Spear Streets are structures typifying early construction in the area. The 3-story Schou-Gallis brick building occupying the southwest corner of the intersection of Mission and Spear Streets reflects the character of buildings constructed south of Market Street in the early part of the 20th century (Figure 18, page 43). There is currently a proposal to remove the structure and construct an 18-story office building on the site, the 101 Mission Street Office Building (EE 79.236).

The 5-story Folger Coffee Company Building at the southwest corner of the intersection of Spear and Howard Streets was renovated during the early 1970s and is currently used as office space (Figure 19, page 44). Renovation of this brick building established an architectural style that was partially reflected in the design and use of brick in the Borel building constructed to the north of the intersection (Figure 19, page 44).

Building colors range from red in the use of brick to brick that is painted yellow, and the tan and grey of concrete panels on building exteriors constructed near the project site since 1970. The dark grey, plain glass of the 18-story Veterans Administration Building located at Howard and

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[1]Other structures on the block designed by architects for the proposed project, Jorge De Quesada, Inc., include the Borel building, the Howard and Main Street office building adjacent the project site, the 150 Spear Street office building and 101 Mission Street office building (currently being designed), EE 79.236.

View north along Main Street. Cross street is Mission Street.

View of building on southwest corner of Mission and Spear Street intersection.

Project Area Photographs

Source: EIP Corporation

Figure No. 18

Folger Coffee Company Building on southwest corner of Howard and Spear Street intersection.

View of Borel Building (right) and Howard and Main Street Office Building.

Project Area Photographs

Source: EIP Corporation

Figure No. 19

Main Streets contrasts with the brick ornamentation and arched windows and entries of the adjacent Folger Coffee Company building. The mix of building styles, colors and contrast in building heights between old and new buildings in the area provide a varied design theme that is not unified. However, the bulk of new highrise structures relates to previously constructed highrise buildings in the project area.

At ground level near the project site, views to the north encompass highrise structures in the south of Market Street area that block views toward the skyline profile of buildings of the Financial District (Figure 18, page 43). Views to the west are largely confined due to elevated freeway ramps; the 30-story Pacific Gateway Building is currently under construction adjacent to the freeway ramps. Views south along Main Street are largely confined due to the Howard and Main Street building adjacent to the project site, the Veterans Administration Building and elevated freeway ramps. The visual impression in the area is one of an increasingly urbanized environment where low-profile buildings of earlier design trends with light industrial land uses are giving way to taller structures devoted to office use with variation in design style and use of exterior surfacing materials.

F. SOILS AND SEISMICITY

1. Soils

The project area is underlain by about a 20-foot thickness of artificial fill containing bricks, wood and other rubble.[1] Fill was progressively placed in the project area between 1852 and about 1914.[2] The fill is underlain by

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[1]Lee and Praszker, "Geotechnical Input for EIR on 101 Mission Street, San Francisco," July 1980.

[2]Ibid.

soft Upper Bay mud, Lower Bay mud with interbedded sand and gravel, alluvium and Franciscan Bedrock.

The lowest extent of Upper Bay mud in the vicinity of the project site is on the order of 80 to 100 feet below the ground surface; the depth to bedrock is approximately 200 feet.[1] The soft, compressible Upper Bay mud is thought to be thinner under the proposed Spear and Main project site; sand layers are anticipated to be thicker under the site than in the general area.[2]

Groundwater in nearby areas is found approximately 8 to 10 feet below the ground surface.[3] The soft Bay mud and the lower portion of the fill are thus saturated with water.

2. Seismicity

No known active faults cross the project site. However, strong ground motion could result from movement along the San Andreas, Hayward or Calaveras Faults. The San Andreas Fault zone is located approximately 9 miles southwest of the site; the Hayward and Calaveras Fault zones are approximately 15 and 30 miles to the east, respectively.

G. HISTORICAL RESOURCES

A principal structure of architectural and historical significance in the immediate area of the project site is the Rincon Annex Post Office on the southeast corner of Mission and Spear Streets. Constructed in 1939 with Gilbert Stanley Underwood as consulting architect and Louis A. Simon as supervising architect, the Post Office has been placed on the

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[1]Lee and Praszker, "Geotechnical Input for EIR on 101 Mission Street, San Francisco," July 1980.

[2]Richard Rogers of Lee and Praszker, Consulting Civil Engineers, telephone communication, 20 October 1980.

[3]Lee and Praszker, op. cit.

National Register of Historic Places, and is on the San Francisco listing of Architecturally and/or Historically Important Buildings.[1] The structure has been given a Department of City Planning (DCP) rating of 4.[2]

In addition, within about a 2-block radius of the project site, 3 other buildings are on the San Francisco list of Architecturally and/or Historically Important Buildings. These buildings include the Southern Pacific Towers along Spear Street from Market to Mission Streets (DCP rating of 4), the Southern Pacific Building at 1 Market Street (Heritage rating of A, DCP rating of 4), the Pacific National Life Building at 215 Market Street (Heritage rating of A, DCP rating of 4), and the PG&E Building at 245 Market Street (Heritage rating of A, DCP rating of 4). Other buildings in the area not on the list but included in the DCP survey are

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[1]Adopted by the City Planning Commission, Resolution No. 8600, 29 May 1980.

Section 1011 of the City Planning Code directs that structures recognized by state or federal historic agencies are to be included on a listing of Architecturally and/or Historically Important Buildings.

[2]Heritage Survey refers to a survey of downtown buildings located along Market Street and in the dowtown financial and retail districts conducted by the Foundation for San Francisco's Architectural Heritage. Buildings constructed after 1945 were not rated. An 'A' rating indicates the most important individual buildings, distinguished by outstanding qualities of architecture, historic and cultural value and relationship to environment. A 'B' rating indicates buildings which are individually important for their overall quality rather than for particular, outstanding characteristics.

DCP Survey refers to an architectural survey of all buildings in the City conducted by the Department of City Planning between 1974 and 1976. Those buildings considered to have architectural value were rated as to the degree of architectural value from a low of "0" to a high of "5". Factors considered included architectural significance, urban design context and overall environmental significance. In the estimation of the inventory participants, buildings rated "3" or better represent approximately the best 2% of the City's architecture.

the 72 Spear Street Building (DCP rating of 1), the Folger Building at the southwest corner of Spear and Howard Streets (DCP rating of 2), the 101 Mission Building (DCP rating of 1), the 115 Main Street Building (DCP rating of 1), the 101 Market Street Building (DCP rating of 2), and the 100 Mission Street Building (DCP rating of 1).

Buildings on the project block with frontages on Mission Street and the portions of Spear and Main Streets toward Mission Street are structures dating from around 1900 to the 1920s. They are constructed with brick and concrete, and are generally of simple architectural expression. Two buildings that appear to date from before the 1906 earthquake and fire are the former stables at 115 Main Street and the adjacent building at the corner of Main and Mission Streets (Figure 18, page 43). Both are 2-story brick structures and express their different use in the way the structures were designed. The stables retains its second-floor hay doors and wooden hoist; the ground floor has double wooden entrance doors in addition to single ones. The facade has a stepped, brick parapet, or false front, with a brick cornice[1] molding. The corner building at Mission and Main Streets has 2 bays on Mission Street and 18 bays on Main Street. The building has a brick cornice and 2 types of brick window openings on the first and second floors. Both buildings are typical in architectural style for their period of construction. The other building that would be a neighbor of the proposed project is located adjacent to the proposed 150 Spear Street Office Building. This structure is a 4-story brick building with a pressed metal cornice and iron balconies on the upper floors that are connected to fire escapes. The ground floor, somewhat altered, houses the Spear Street restaurant.

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[1]Cornice: the projecting horizontal member along the top of a roof line.

Of the buildings that formerly occupied the site, 2 were built in 1907, one in 1913-1914 and one in 1938, according to San Francisco Department of Building Records. It is assumed the structures were principally used for warehousing and offices.

H. COMMUNITY SERVICES

1. Police

The proposed project site is subject to routine police patrol by a two-man squad car along both Main and Spear Streets. The area is under the jurisdiction of Southern Station at 850 Bryant Street.

Between 1 January 1980 and 30 June 1980, 87 reported thefts were committed in the project area, of which 46 were grand thefts. The majority of known crimes committed were concerned with stolen automobiles and automobile stripping.[1]

2. Fire

The nearest fire alarm box to the proposed project is Box 2116 at the intersection of Main and Mission Streets. Three stations of the San Francisco Fire Department are able to respond to calls from this box:

- Station 35, at 676 Howard Street (3-minute response time)
- Station 13, at 530 Sansome Street (3-minute response time)
- Station 1, at 416 Jessie Street (3-minute response time)

The response times from these stations to the proposed project site are average times and would vary depending on the time of day, traffic conditions, weather, and other

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[1]Paul Libert, Officer, Planning and Research, San Francisco Police Department, personal communication, 3 November 1980.

factors affecting travel on the streets. High and low-pressure fire hydrants are located at Mission/Spear Streets and Mission/Main Streets.[1]

3. Water

Water for San Francisco is provided from the Hetch Hetchy project and the San Francisco Water Department system via the Crystal Springs and San Andreas reservoirs. The 140-million gallon capacity reservoir at University Mound (northeast of John McLaren Park) serves the project area as well as the Marina and the downtown and industrial areas of San Francisco.

Eight and a 12-inch low-pressure water mains are located under Mission Street, a 6-inch main exists under Main and Howard Streets and there is an 8-inch line under Spear Street. A 20-inch water transmission line located beneath Main Street between Folsom and Market Streets also supplies the project area.[2]

4. Sewer

A 12-inch sewer line is located under Spear Street which will be replaced with a line of various widths (12, 15 and 18 inches), and a 4 x 6-foot sewer is located under Main Street between Mission and Howard Streets.[3] The new main will be constructed as soon as a contractor is selected. The facilities carry wastewater flow to the Northpoint Water Pollution Control Plant which has a general maximum capacity of 135 million

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[1]Eugene Calamorini, Captain, Planning and Research, San Francisco Fire Department, personal communication, 3 November 1980.

[2]San Francisco Water Department, Gate Book, map, main locations showing existing facilities; verified by telephone by George Nakagaki, Assistant Manager, San Francisco Water Department City Distribution Division, 3 November 1980.

[3]Nat Lee, Engineering Associate, Bureau of Sanitary Engineering, Department of Public Works, personal communication, 3 November 1980, 10 February 1981 and 29 June 1981.

gallons per day (mgd), and an emergency capacity of 150 mgd. Average dry weather weekday flow to the plant is between 56 and 62 mgd.[1]

5. Solid Waste

The Golden Gate Disposal Company serves the project area. Solid waste removal takes place as often as necessary or requested and is brought to a transfer station west of Candlestick Park before its final destination at the Mountain View dump. This dump has a 2½ year capacity after which time, San Francisco's solid waste would go to dumping sites in Vacaville and Altamont.

I. ENERGY

The project area is supplied with electricity and natural gas by Pacific Gas & Electric Company (PG&E). The site does not contain a building and energy is not consumed on the site.

J. ECONOMIC AND FISCAL

At present, no commercial activity exists on the site and no employment is available (see Chapter II.A., Land Use, page 17).

The 1980-1981 assessed value of the proposed project site was approximately $506,000 ($501,000 in land, $5,000 in surface paving improvements). At the 1980-1981 composite tax rate of $4.97 per $100 assessed value, the site generated about $25,200 during the fiscal year.[2] This is distributed

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[1]Michael McDevitt, Assistant Manager, Northpoint Water Pollution Control Plant, Department of Public Works, telephone conversation, 29 June 1981.

[2]Of the total tax, about $20,300 represents the maximum allowable under Proposition 13 per general government expenditures ($4.00 per $100 assessed valuation), and $4,900 was levied to finance bond obligations previously approved by the general electorate ($0.97 per $100 assessed valuation).

to the City and County of San Francisco (84.8%, about $21,300); the San Francisco Unified School and Community College District (8%, about $2,000); BART (7%, about $1,800 for bond payments only); and the Bay Area Pollution Control District (0.2%, about $50).

The City and County of San Francisco currently incurs some cost to provide services to the site such as fire and police protection, street lighting and cleaning, and street and storm maintenance.

Employment and Housing[1]

In examining the distribution of income among employees in San Francisco's downtown highrises (Table 5a, page 52a), the majority of clerical workers fall into the income categories of $25,000 annually or lower, and most of the managers, proprietors, and professional and technical workers are in the income categories of $25,000 annually or higher.

Table 5b, page 52b, provides an indication of the range of prices for different types of housing in the City, both rental and purchase units in 1980. The estimated vacancy rate for the total number of units in the City is 5.6.[2]

Housing in San Francisco is generally purchased by household rather than individuals (although 1-person households still exist in the City). Table 5c, page 52c), provides an estimate of the percentages of the expected employee population of new highrise office buildings which could afford a given housing type. This table assumes that for home purchases, the households would make a 20% down payment, and had a 15% interest rate of a 30-year mortgage term.

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[1]Environmental Impact Planning Corporation, "Estimating Employee/Housing Impacts for Downtown San Francisco Highrise Office Buildings," October 1981. A copy of this information is available at the Office of Environmental Review.

[2]Department of City Planning, "The Housing Element, I. Background Data and Needs Analysis", December 1980, revised September 1981, page 3.

TABLE 5a

Income Ranges for Office Workers
in Downtown High-Rises 1980

Occupational Distribution	Individual Income Distribution (salaries and wages)[1] Under 12,800	12,800 15,999	16,000 23,999	24,000 31,900	32,000 39,999	40,000 79,999	80,000+	
Professional and Technical	6	11	34	51	50	37	42	
Managers and Proprietors	1	4	14	23	40	49	50	
Clerical	92	81	44	14	4	4	1	
Sales	1	2	5	10	5	7	4	
Others	-	2	3	2	1	3	3	
TOTAL	100%	100%	100%	100%	100%	100%	100%	
% of Individuals in Range[2]	18.6%	16.5%	22.4%	19.1%	10.4%	10.7%	2.4%	TOTAL 100%
% of Households in Range	15.1%	8.9%	15.2%	20.3%	16.8%	20.3%	3.3%	TOTAL 100%

Source: EIP; San Francisco Planning and Urban Renewal Association Impact of Intensive High-Rise Office Development-Detailed Findings, Table 21, page 117 (1975).

[1]The income data are based on raw data from a survey of 1,022 office workers in San Francisco high rise buildings conducted in April 1974 for the SPUR Study. The 1980 income ranges were developed by inflating the 1974 ranges by 60%.

[2]The survey asked each respondent to moderate his/her income as well as household income.

TABLE 5b

Housing Prices in San Francisco, 1980

Rentals: Average Monthly Rent	
Studio Apartment	$292
1-Bedroom	382
2-Bedroom	572
3+ Bedrooms	670
All rentals	490

Purchase: Average Sales Price	
New Single Family	$129,170
New Unit in 2-4 Unit Bldg.	85,590
Existing Single Family	89,590
Existing Unit in 2-4 Unit Bldg.	57,590

Source: EIP Department of City Planning "The Housing Element, I Background Data and Need Analysis", December 1980, Revised September 1981, Table 3, page 3.

TABLE 5c

Percent of Office Worker Households able to Afford Various Monthly Housing Costs, 1980

Housing Type	Median Monthly Cost	% Able to[2] Afford Cost
(Rental)		
Studio Apartment	$292	100
One Bedroom	382	86
Two Bedroom	572	77
Three or More Bedrooms	670	71
All Rental Units	490	80
(Purchase)		
New Single Family	1,307	17
New (unit in) 2-4 Unit Bldg.	583	77
Existing Single Family	906	31
Existing (unit in) 2-4 Unit Bldg.	583	77

[1]Housing costs derived from Table 5b; rental costs as given, monthly housing expenditure for purchase assumes 20% down payment, 15% mortgage interest, 30-year mortgage.

[2]Interpolated from Tables 5a and 5b.

CHAPTER III

IMPACTS[1]

A. LAND USE

The proposed project would add 271,600 net rentable square feet of office space, 7,460 net rentable square feet of retail space and an 18,700 square feet basement parking area, capable of accommodating 36 cars. Specific major tenants are not known at this time (see Chapter I, Project Description, page 1).

The proposed project would be part of a trend of increasing intensification of office development in the South of Market area. Cumulatively, this may create secondary impacts in the form of further development of support retail shopping and service-related establishments to serve the increased employee population. It may also create "spillover" effects such as increased land demand in the South of Market area, employment displacement and increased housing demand.

The project would also contribute on an incremental, but cumulative basis, to economic, fiscal, transportation and visual impacts occurring as a result of general downtown development within San Francisco. (See Chapter III, B. Transportation, page 55; E. Visual Quality and Urban Design, page 77; J. Economics, page 96). From a planning perspective, concern for the nature and extent of these cumulative impacts has raised questions of the appropriate level of growth in the C-3 district, land use preferences and planning controls and criteria for such development.

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[1]Since preparation of the Preliminary Draft EIR, the gross floor area of the proposed project has been adjusted downward by 3%, and net rentable area has been adjusted downward by 2.5%. Therefore, impacts shown are worst case conditions. None of these changes have required changes in the calculation of transportation impacts because they fall within the ± 10% level of statistical validity of the methods used to predict the impacts.

However, the objectives and policies of the Commerce and Industry Element of the City and County of San Francisco Comprehensive Plan and the discretionary review criteria described in Chapter I.D., Zoning and Required Approvals, (page 17), provide a policy framework against which the project may be evaluated.

Downtown Office Objective 6 of the Element states:

"Maintain and improve San Francisco's position as a prime location for financial, administrative, corporate, and professional activity."[1]

Five Policies are contained under Objective 6.

Policy 1: "Encourage continued growth of prime downtown office activities so long as the undesirable consequences of such growth can be avoided."[2]

The proposed project would be consistent with Policy 1 for continued office development. However, as noted in the Element,". . . assuming that (environmental and aesthetic) costs are controlled within publicly acceptable limits, the City should encourage continued office growth."[3] Accordingly, the proposed project should be measured against any adverse impacts it would cause in determining what would be "publicly acceptable" (see Chapter V., Unavoidable Adverse Impacts, page 115).

Policy 2: "Guide location of office development to maintain a compact downtown core so as to minimize displacement of other viable uses."[4]

The project would occur within the downtown area, assisting to maintain a compact form of downtown development.

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[1]Department of City Planning, Commerce and Industry Element, Policies and Objectives, 1978, page 24.

[2]Ibid.

[3]Ibid. page 25.

[4]Ibid.

The project would displace open-air parking to other locations (see Chapter III.B., Transportation). No buildings would be removed because of the project.

Policy 3: "Assure that downtown development is compatible with the design and character of San Francisco."[1]

The visual impact of the proposed project is noted in Chapter III.E., page 77, of this report.

Policy 4: "Provide adequate amenities for those who live, work and use downtown."[2]

A landscaped open air pedestrian plaza, a restaurant and retail space is proposed in the project for use principally by its occupants.

Policy 5: "Control traffic and congestion in the downtown area, particularly from private automobiles.[3]

Traffic impacts associated with the proposed project are detailed in Chapter III.B., below.

B. TRANSPORTATION

1. Project and Cumulative Trip Generation/Distribution

The City's transportation impact analysis guidelines[4] explicitly recommend trip generation and modal split factors. The guidelines suggest that a total of 17.5 daily person trips would be generated per 1,000 square feet of leasable area in an office project. In addition, based upon research conducted by the California Department of Transportation (CalTrans), it is estimated that the project's retail shops would generate approximately 100 person trips daily per

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[1]Department of City Planning, Commerce and Industry Element, Policies and Objectives, 1978, page 26.

[2]Ibid., page 27.

[3]Ibid.

[4]San Francisco Department of City Planning, Guidelines for Environmental Evaluation - Transportation Impacts, June 1980, revised October 1980.

1,000 square feet of net retail area.[1] It is also estimated that about 25% of these retail-generated trips would be internal to the building or adjacent buildings within the block bounded by Mission, Spear, Howard and Main Streets.[2] The proposed project would therefore generate a total of 5,000 daily person trips (excluding trips to/from the shops which would be internal to the immediate project area) of which approximately 2,700 would be work trips and 2,300 would be non-work trips. Approximately 1,000 of the daily trips would occur during the evening peak hour.

In comparison with the foregoing figures, the City projection[3] of cumulative travel for other projects is about 25,500 peak hour person trips. The project would therefore account for approximately 4% of the cumulative trip generation.

Based upon the suggested modal split contained in the City guidelines,[4] the apportionment of project trip generation has been calculated and compared to the cumulative trip generation of other development. The various trip totals are outlined in Table 6, page 58.

2. Impacts on the Street System

In establishing the base traffic conditions without the project, it must be recognized that traffic increases will result from projects approved but not yet completed. Projections by the City Planning Department[5] indicate that p.m. peak hour travel on Muni's downtown lines will increase by about 30%. Based on these

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[1]San Francisco Department of City Planning, Final Environmental Impact Report, 315 Howard Office Building, (EE 79.196) certified 21 August 1980. Specific types of retail activities for the project have not been defined.

[2]Estimate by George W. Nickelson, Traffic Engineer for EIP Corporation.

[3]San Francisco Department of City Planning, Guidelines for Environmental Evaluation - Transportation Impacts, June 1980, revised October 1980.

[4]Ibid.

[5]Ibid.

projections, the total peak hour auto travel in the downtown area could also increase by approximately 30%, or a total of 9,000 new p.m. peak hour auto trips as a result of the approved development[1] (see Table 6, page 58). An increase of this magnitude would affect traffic flow. The proposed project would generate 360 p.m. peak hour auto trips which would be approximately 4% of the volumes generated by projects approved but not yet completed in the downtown. If these increases are applied to the existing peak hour volumes obtained for the Mission/Spear, Mission/Main, Mission/Beale and Main/Howard intersections, the following service levels would result:

	Existing Service Level	Peak Hour Service Level in 1983 without Spear and Main Street Project	with Spear and Main Street Project
Mission/Spear (PM Peak Hour)	A	A	A
Mission/Main (AM Peak Hour)	B	D	D
Mission/Beale (PM Peak Hour)	C	E	E
Main/Howard (PM Peak Hour)	A	B	B/C

In addition to a degradation in the quality of traffic flow on surface streets (as a result of the cumulative development), the freeways and freeway ramps will be critical links in the overall network. With the freeways currently operating under congested conditions during peak hours, the traffic increases generated by cumulative downtown development would add to this congestion with the likely result that travel delays would be extended. A further concern is related to the potential demolition of The Embarcadero Freeway. Although no specific projections are available, the removal of this freeway

[1]San Francisco Department of City Planning, Guidelines for Environmental Evaluation - Transportation Impacts, June 1980, revised October 1980.

TABLE 6

PROJECT AND CUMULATIVE TRIP GENERATION DURING P.M. PEAK HOUR

Mode and Distribution	Project	Other[1] Development	Total
Auto			
North Bay	40	1,704	1,744
Peninsula	58	2,075	2,133
East Bay	86	2,584	2,670
San Francisco	176	2,637	2,813
Total Auto	360	9,000	9,360
MUNI	288	7,151	7,439
BART			
East Bay	91	1,989	2,080
Daly City	60	1,764	1,824
AC	84	2,082	2,166
SAMTRANS	15	367	382
S.P.R.R.	44	1,095	1,139
GGT	46	1,161	1,207
FERRY	14	353	367
OTHER	28	552	580
TOTALS	1,030[2]	25,514	26,544

[1]Source: San Francisco Department of City Planning, Guidelines for Environmental Evaluation - Transportation Impacts, June 1980, revised October 1980. "Other Development" includes those projects listed (incorporated by reference herein), and downtown projects approved through October 1980 but not yet built.

[2]This number exceeds the 1,000 person trip projection because intermodal transfers are included.

would divert traffic to surface streets and could focus further traffic on the Mission/Main and Mission/Beale freeway ramps.[1] The demolition project is considered to be among the City's highest priorities, but the final decision depends upon the findings of an environmental review of the project. The federal government has allocated $0.5 million for the environmental review of the demolition and $83 million once earmarked for the Interstate 280 connection to the Embarcadero Freeway has been transferred to other projects.[2]

3. Transit Impacts

MUNI. The 1983 patronage characteristics and load factors for the various downtown MUNI lines are outlined in Table 7, page 60. These statistics already reflect the growth in patronage due to other downtown development. The additional peak hour patronage due to the proposed project was added to the 1983 patronage projections on a proportional basis. As indicated in Table 7, the project would have minimal impacts on the 1983 load factors. However, those lines with load factors greater than 1.00[3] would be experiencing significant congestion. Since the listed load factors are an average during the peak hour, certain runs could experience even greater congestion.

In discussions with MUNI staff,[4] it appears that the system capacity can be increased 10-15% by 1983. This increase would reflect added capacity in the MUNI Metro light-rail service, and the replacement of existing buses with articulated

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[1]Northeast Waterfront Survey, ROMA-Architects and Planners, 1979.

[2]Chi-Hsin Shao, Department of City Planning, Transportation Section, telephone conversation, 17 April 1981.

[3]A load factor of 1.00 reflects a ridership of 150% of available vehicle seating.

[4]Susan Chelone, MUNI Planning Department, telephone communication, 4 February 1981.

TABLE 7

SUMMARY OF ESTIMATED MUNI PATRONAGE, 1983
P.M. PEAK HOUR-OUTBOUND DIRECTION *

LINE	1983 PATRONAGE WITHOUT PROJECT	1983 PATRONAGE WITH PROJECT	CAPACITY	LOAD FACTORS WITHOUT PROJECT	LOAD FACTORS WITH PROJECT
1	499	504	450	1.11	1.12
1X	766	774	750	1.02	1.03
2	716	723	600	1.19	1.21
3	638	644	525	1.21	1.23
4	294	297	375	.79	0.79
5	1,233	1,245	1,275	.97	0.98
6	627	633	675	.92	0.94
7	410	414	450	.91	0.92
8	823	831	1,125	.73	0.74
9	663	670	750	.88	0.89
11	844	852	750	1.13	1.14
12	609	615	525	1.16	1.17
14	1,521	1,536	1,275	1.19	1.20
14GL	317	320	300	1.06	1.07
14X	819	827	675	1.21	1.23
15	1,108	1,119	975	1.14	1.15
21	827	835	825	1.00	1.01
27	196	198	300	.65	0.66
31	626	632	525	1.19	1.20
31X	713	720	675	1.06	1.07
32	520	525	1,050	.50	0.50
38	1,236	1,248	1,125	1.10	1.11
38L	819	827	675	1.21	1.23
38AX	631	637	600	1.05	1.06
38BX	242	244	300	.81	0.81
40X	403	407	525	.77	0.78
41	No statistics available				
42	289	292	300	.96	0.97
55	1,821	1,839	1,650	1.10	1.11
61	No statistics available				
71	474	479	375	1.26	1.28
72	346	349	300	1.15	1.16
80X	542	547	600	.90	0.91
J	998	1,008	1,235	.81	0.82
K	3,901	3,940	3,900	1.00	1.01
L	No statistics available				
M	No statistics available				
N	2,565	2,590	2,400	1.07	1.08

*Source: San Francisco Department of City Planning, Guidelines for Environmental Evaluation Transportation Impacts, 3 July 1980, revised October 1980.

coaches. This capacity increase would generally relieve the projected load factors; specific benefits would depend upon a more detailed improvement program with capacity increases cited for each route.

BART. The committed downtown development would increase BART ridership quality/quantity by approximately 20% (the proposed project would contribute an additional 1% to this increase). It is projected that the East Bay trains would experience average peak hour load factors of 1.4-1.6 and higher factors on certain peak trains. BART's short-term (5-year) improvement program, however, calls for an approximate 20% increase in capacity, (with added cars and some decrease in headways.[1] These improvements would allow the peak hour load factors to average 1.1-1.3 and these factors are considered acceptable by BART staff.[2]

AC Transit. AC Transit's current peak hour service has a capacity reserve of 3,500 persons (assuming capacity equals 125% of the vehicle seats). The proposed project and cumulative development would generate about 2,060 new trips, absorbing most of this excess capacity. A.C. Transit staff indicate the capacity will be increased approximately 10% over the next 3-4 years and this increase would raise the capacity reserve while preserving somewhat lower load factors on peak-hour vehicles.[3] If the proposed downtown bus terminal to replace the existing Transbay Terminal is built, operating efficiency could be increased to the point where a greater number of buses per hour could be accommodated.[4]

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[1]Ward Belding, BART Planning Staff, telephone conversation, 23 July 1980.

[2]Ibid.

[3]Gene Gardner, AC Planning staff, telephone conversation, 23 July 1980.

[4]Ibid.

Golden Gate Transit. With a design capacity of 8,085 peak-hour passengers, the effect of cumulative downtown development would be to raise patronage beyond this figure. Because of financial limitations it is likely that the District would not be able to markedly increase its capacity.[1]

SamTrans and Southern Pacific. The patronage from cumulative development would appear to exceed the available reserve capacity of SamTrans. No specific capacity improvements have been cited by the District.

The Southern Pacific service would be improved through the addition of (within 3-5 years) approximately 1,200 seats to the southbound peak capacity.[2] With the systems existing reserve capacity of about 1,530 seats, the total capacity reserve would be about 2,730 seats. Thus, the addition of about 1,140 new peak hour passengers (due to cumulative downtown development) could be accommodated.[3]

4. Parking Impacts

Based upon the trip generation characteristics of the project, the parking demand has been calculated at approximately 340 long term spaces and 145 short term spaces.[4] With 35 parking spaces proposed as a part of the project, the majority of the demand would need to be accommodated at other locations in the area. Since previous parking/inventory/occupancy surveys

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[1]Peter Dyson, Golden Gate Transit, telephone conversation 17 July 1980.

[2]Cecil Smith, CalTrans, Southern Pacific data based on telephone conversation, 27 April 1981.

[3]Ibid.

[4]Long-term parking = 2,700 daily commute trips x 25% auto÷2 trips per vehicle. Short-term parking = 2,00 daily non-work trips x 50% auto÷2 trips per vehicle÷turnover rate of 4.

in this area (see Section II.B., Transportation, Setting, page 20), indicate occupancy rates of 85-95%, little parking is currently available. The occupancy would be even higher with the development of other nearby projects - the Pacific Gateway and 150 Spear Street office buildings, the 115-135 Main Street building, the Main and Mission Street building and the 101 Mission Office Building (see Figure 13, page 22). In addition, the other 7,000,000 square feet of downtown development projected for the next 5 years would add to the parking demand in the downtown area.[1] Although the proposed project would account for less than 5% of this increase in parking demand, there would be cumulative demand. It is likely that parking would shift further from downtown with increased parking demand south of Folsom Street and beyond. If no parking is provided as a part of the project, the demand for the 36 on-site spaces would have to be accommodated elsewhere in the project area. The area's parking deficit would be increased accordingly.

The proposed project's truck loading needs have been calculated on the basis of downtown development guidelines.[2] These guidelines recommend 0.1 space per 10,000 gross square feet of office area. The proposed project's truck loading needs have been calculated as follows:

- 306,400 sq. ft. (total project) @ 0.1/10,000 = 3.1 spaces

These calculations indicate a need for 3 off-street truck loading spaces. The proposed project's 2 large truck docks and 3 delivery van spaces in the basement would meet this requirement.

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[1]San Francisco Department of City Planning, Guidelines for Environmental Evaluation - Transportation Impacts, June 1980, revised October 1980.

[2]San Francisco Department of City Planning, Guiding Downtown Development, May 1981, page D-8.

Project parking would be provided in the basement, generally arranged adjacent the interior walls of the basement surrounding the building's centrally located mechanical cove and stairs (Figure 9, page 13).

5. Pedestrian Impacts

Since all the proposed project's trips would involve at least some walking, pedestrian trips would be added to the sidewalks and crosswalks adjacent to the project site. Based upon travel research conducted by the California Department of Transportation,[1] it is estimated that approximately 30% of the 5,000 daily trips would occur in the 4:00 p.m. - 6:00 p.m. period and 20% in the 11:30 a.m. - 1:30 p.m. period. Thus, 1,000 midday pedestrian trips and 1,500 p.m. peak period pedestrian trips would be added to the existing pedestrian flows; the total projected flows are depicted in Figure 20, page 65. Based upon these projections, the quality of peak period pedestrian flow would degrade slightly so that impeded flows would be experienced along Main Street (north of the site). The cumulative pedestrian impacts along Main Street would reflect the increased pedestrian flows and vehicle conflicts resulting from the project and other proposed development in the immediate vicinity. Based upon a cumulative impact assessment conducted for the proposed 135 Main project,[2] the p.m. peak hour flow along the east side of Main Street would be 3.0 persons/minute/foot of sidewalk width. With a 12 foot sidewalk width, this rate equates to about 2,160 pedestrians during the peak hour. The pedestrian flow would remain within the "impeded" category. In addition, pedestrian

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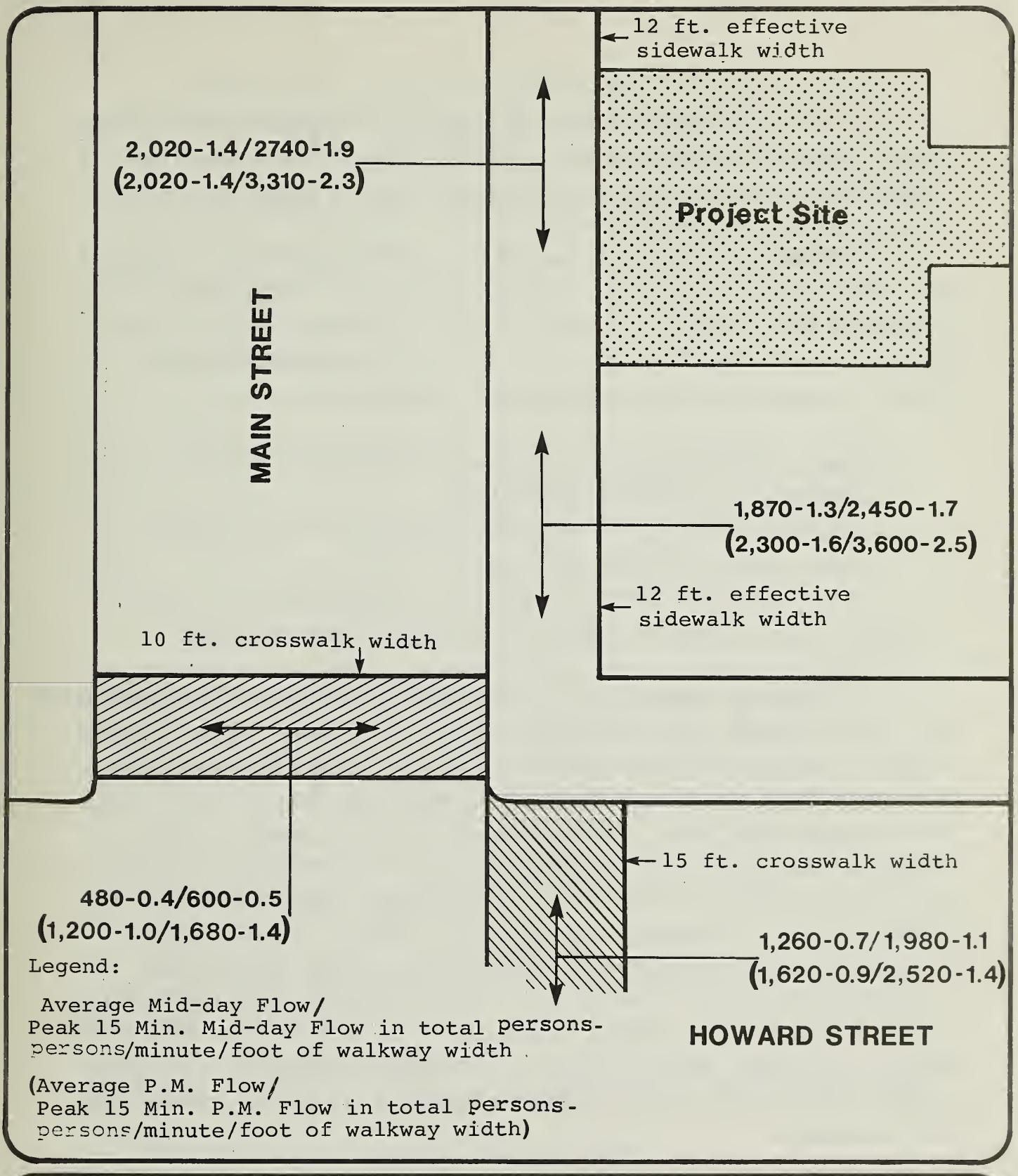
[1]Tenth Progress report on Trip Ends Generation, CalTrans District 4, 1975.

[2]John Flynn, Environmental Planner, Environmental Science Associates, telephone, September 25, 1981.



Pedestrian Conditions with Proposed Project

North
Not to Scale

Note: Mid-day is 11:30 A.M. - 1:30 P.M.
Peak P.M. is 4:00 P.M. - 6:00 P.M.

Source: EIP Corp.

Figure No. 20

crossings of Main Street would be aided by sidewalk widening and signal modifications at the Mission/Main Street intersection.[1] These modifications would allow pedestrians to cross Main Street and the freeway off-ramps.

Pedestrian impacts along Main Street would also reflect the increases in pedestrian vehicle conflicts. The proposed Spear and Main Street, 135 Main Street and Mission/Main Street projects would involve a total of 5 driveway cuts along Main Street. These driveways would occur as follows:

- Spear and Main Street: 2 truck docks and 36 parking spaces using separate driveways
- 135 Main Street: 2 truck docks and 22 parking spaces using separate driveways
- Mission/Main Street: 46 parking spaces and loading/unloading functions using a single driveway

Assuming that all of the project parking would be designated for tenant (long-term) use, the parking turnover rate would occur primarily during the peak hours. A turnover of 50% during the p.m. peak hour would result in 15-20 vehicles crossing the peak hour pedestrian flows. Based upon the traffic flows on Main Street, there would be little delay for vehicles exiting these driveways (Figure 21, page 68), and entering the Main Street traffic flow.[2] Driveway traffic could however, be prevented from entering Main Street as a result of vehicle queues from the Mission/Main Street intersection. In this event vehicles exiting the driveways would probably wait on the sidewalk area, disrupting pedestrian flow. The driveways and increased pedestrian volumes would also add to the potential for pedestrian/vehicle conflicts and accidents.

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[1]John Flynn, Environmental Planner, Environmental Science Associates, telephone, September 25, 1981.

[2]Transportation Research Board, Interim Materials on Highway Capacity (Circular No. 212), Washington, D.C., January 1980, pages 38-40.

Pedestrian circulation within the area would include an intra-block pedestrian system (Figure 21, page 68).[1] This system would link the various buildings within the block (bounded by Mission, Spear, Howard and Main Streets) and would ultimately provide access to/from adjacent blocks. The proposed project as planned would interface with the proposed pedestrian system.

6. Construction Impacts

Although no specific construction process has been formulated, it is projected that about a 2-year construction period would be required. Based upon the construction employee projections for a similar project,[2] this project would have a peak construction employee parking demand of approximately 40 spaces. This demand would compete for the limited parking available in the area.

Although the construction traffic volumes would likely not be high in relation to existing traffic (20-30 trucks daily during the excavation phase),[3] trucks and other construction traffic in the area could disrupt traffic flow. Trucks and equipment could intermittently block a lane or portions of the adjacent Main and Spear Streets throughout the construction process. In addition, construction activities would likely encroach onto sidewalks, causing a reduction in sidewalk widths and more pedestrian congestion.

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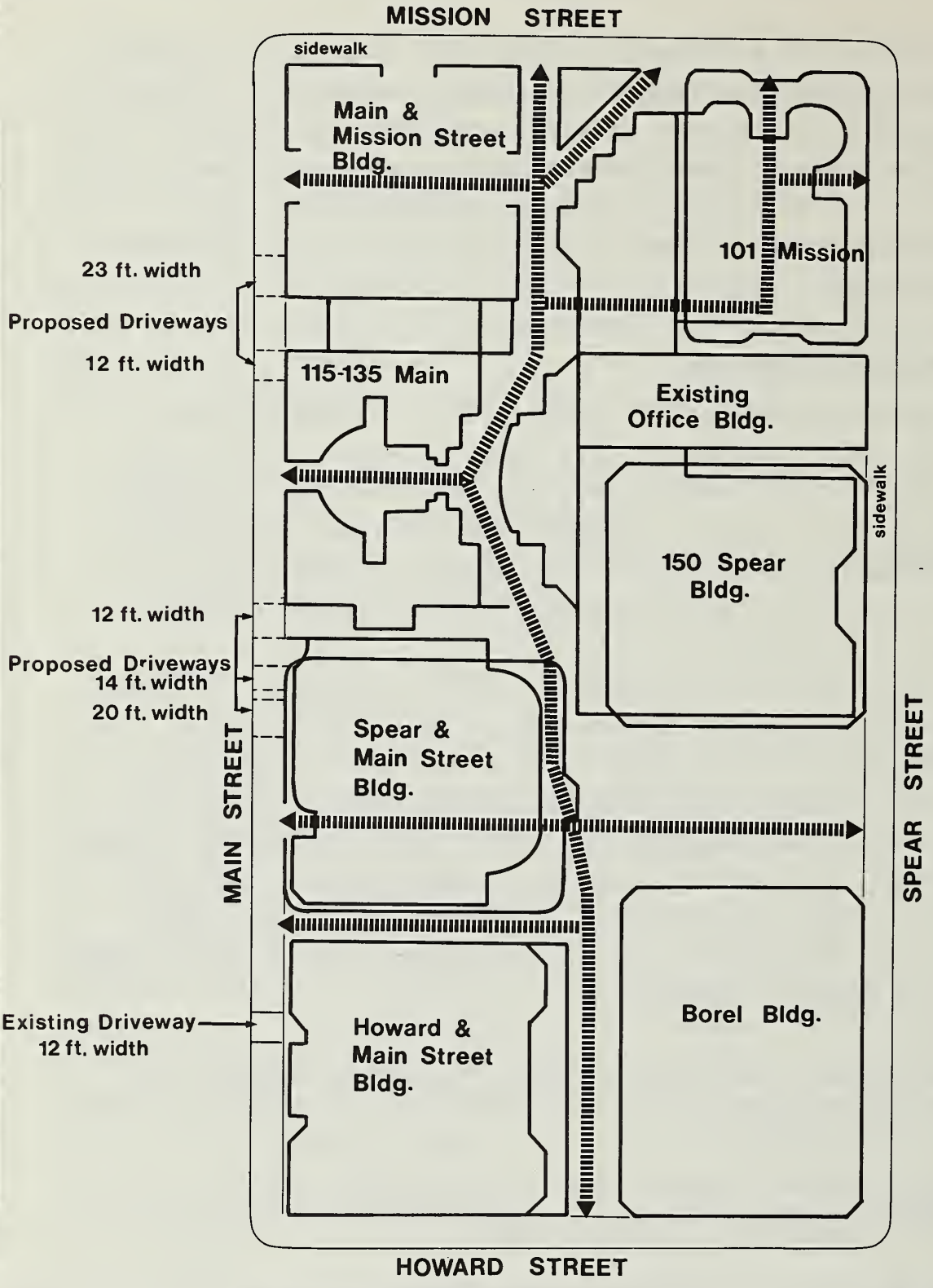
[1]Memorandum from Richard Hedman, Principal Planner for Urban Design, Department of City Planning, to Jorge De Quesada, Architect, 19 June 1981.

[2]San Francisco Department of City Planning, Final Environmental Impact Report, 315 Howard Street Office Building, EE 79.196, certified 21 August 1980.

[3]Section III.D. Impacts, Noise, Page 73.



Block 3717 Pedestrian System

North

0 25 50 100
Scale Feet

Pedestrian Walkway

Source: Richard Hedman, Principal Planner for Urban Design, S.F. Dept. of City Planning

Figure No. 21

C. CLIMATE AND AIR QUALITY

1. Climate

The existing winds near the project site would remain unchanged by construction of the proposed project. The upwind presence of the Financial District and Market Street highrise areas reduce wind strength at the site. Five additional high-rise buildings are either planned or under construction within one block of the site (Section II.A. Land Use, page 18). The effect of these buildings would be to increase shelter at the site.

Shadows from the proposed building would be cast in a westerly direction in the morning, northerly direction near midday, and an easterly direction in the late afternoon (see Appendix B, page A-16). Because of its location on the southwest side of the block, shadows would be cast across the rooftops of existing buildings at midday and in the afternoon. The project would increase (infill) shadows along the surrounding Streets.

The pedestrian walkway extending from the building lobby to Spear Street would be shaded by the project and/or existing buildings in all seasons except summer.

2. Air Quality

Construction activities would generate pollutants in the vicinity of the project. Trucks and equipment would release exhausts, and earthmoving and grading would generate dust and suspended particulates. Available emission factors[1] previously developed for shopping centers and housing construction in suburban desert areas do not apply to downtown construction and are not useful for emission comparison to the proposed project.

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[1]U.S. Environmental Protection Agency, Compilation of Air Pollution Emission Factors, 2 April 1977.

Construction dust and particulates from BART construction in San Francisco did cause measured levels of total suspended particulates to exceed the state and federal standards on several occasions.[1] Construction materials such as plants, solvents and asphalt would emit pollutants for a time after installation. Such materials would be subject to regulation by the Bay Area Air Quality Management District.

Atmospheric emissions from the project would be from combustion of natural gas for water and space heating. Natural gas is a relatively clean-burning fuel compared to oil or coal and no visible fumes or odors would occur. Exhaust gases would be emitted at rooftop level and would be diluted to concentrations below the ambient air quality standards before reaching ground level, but such emissions would contribute to an increase in background levels of pollutants.

The project would act as an indirect source of atmospheric emissions by generating automobile traffic. On the local scale, carbon monoxide (CO) is the most important pollutant emitted by automobiles. Projected carbon monoxide concentrations for 1983 near the site with the project and other anticipated projects were calculated using traffic volumes presented in Chapter III.B. Transportation Impacts (page 55). Results for worst-case meteorological conditions are summarized in Table 8, page 71. A background concentration of 3.0 parts per million has been included. These concentrations represent the exposure a person would have at curbside. The highest concentration would occur along Howard Street during the p.m. peak hour. Carbon monoxide levels would drop off rapidly with distance from curbside. No violations of the standards are indicated.

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[1]Mike Basso, Air Pollution Meteorologist, Bay Area Air Quality Management District, telephone conversation, 13 May 1981.

Similar effects would occur for lead concentrations. Prediction of roadside lead concentrations is not possible; however, lead levels would continue to decrease despite project traffic, as leaded gasoline is phased out. Sulphur is not a major constituent of vehicle exhaust.

The regional impact of the project would be due to the increase in Vehicle Miles Traveled (VMT) associated with the project.

TABLE 8

Curbside Carbon Monoxide Concentrations
in 1983
(parts per million)

	1-hour	8-hour
Beale Street	6.0	3.8
Howard Street	8.7	3.7
Spear Street	5.2	3.6
Federal Standards	35.0	9.0

Based upon transportation estimates of trip generation and destination (see Chapter III.B., page 55), the daily regional increase of VMT due to the project is estimated at 41,000. Using updated composite emission factors supplied by the Bay Area Air Quality Management District[1] and assuming an average trip speed of 25 mph, total regional emissions from the project traffic are estimated in Table 9, page 72.

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[1]Emission factors provided by Mike Kane, Engineering Division, Bay Area Air Quality Management District.

TABLE 9

Regional Automobile Emissions
(tons/day)

Pollutant	1983 Project Emissions	1983 Regional Emissions[1]
Carbon Monoxide	0.89	1,365
Hydrocarbons	0.07	865
Nitrogen Oxide	0.09	730

Increases in hydrocarbons and oxides of nitrogen result in the formation of photochemical oxidants. A 1979 study of regional air quality[2] found that photochemical oxidants would be a persistent problem in the future in the Bay Area, and that reductions in hydrocarbons and oxides of nitrogen emissions would be necessary to attain the federal standard for photochemical oxidant (ozone) in the region. The project's emissions would represent an increase of, at the most, 0.04% in regional emissions of the 3 pollutants listed in Table 9. Photochemical oxidant modeling conducted for the proposed Yerba Buena Center[3] showed that the emissions from that project would result in no measurable change in Bay Area oxidant concentrations. The regional emissions for the proposed project would be about 5-10% of those for the Yerba Buena project; therefore, no measurable effect on regional oxidant concentrations would be anticipated.

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[1]Bay Area Air Pollution Control District, Air Pollution and the San Francisco Bay Area, June 1977.

[2]Association of Bay Area Governments, 1979 Bay Area Air Quality Plan, January 1979.

[3]San Francisco Department of City Planning and San Francisco Redevelopment Agency, Final Environmental Impact Report, Yerba Buena Center, EE 77.220, certified January 1978.

Indoor Air Pollution

Indoor air within the proposed building would be affected by cigarette smoke and gases released by some building materials. Cigarette smoke generates particulates and carbon monoxide, and building materials are known to generate radon, a radioactive gas, and organic gases such as formaldehyde. The human exposure to these pollutants would be primarily determined by the rate of ventilation. However, the rate of air exchange required inside the building to prevent gases building to toxic levels cannot be predicted.

D. NOISE

Compatibility With the Existing Noise Environment

San Francisco has adopted guidelines for determining the compatibility of various land uses with different noise environments. For offices, the guidelines state that in an exterior noise environment of 70 Ldn, "new construction and development should be undertaken only after a detailed analysis of the noise reduction measurements is made and needed noise insulation features are included in the design."[1]

The proposed structure would contain fixed windows. This would reduce traffic noise by about 30 dBA. Instantaneous maximum sound levels of about 85 dBA are expected along the Main Street side of the building and outside the retail shops facing Main Street. Interior maximum sound levels of up to 55 dBA would be expected as trucks pass the site. The traffic-generated Leq inside the perimeter rooms of the building facing Main Street would be about 40 dBA and about

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[1]Transportation Noise Section, Environmental Protection Element of the Comprehensive Plan of the City and County of San Francisco.

35 dBA in the perimeter rooms facing Spear Street. An Leq of 45 dBA would be considered the upper limit of acceptability for traffic noise in a private or semi-private office or small conference room where good listening conditions are desired.[1] The average sound levels would therefore be compatible with the proposed use. The projected instantaneous maximum levels of up to about 55 dBA could interrupt the speaker talking in a normal tone of voice in a small conference room. These maximum levels would not interfere with telephone conversations; however, they would be sufficiently high to cause some distraction.

Noise Impact on Adjacent Land Uses

Post-construction operation of the Spear and Main Street building could affect the existing acoustic environment in the area in 2 ways: by generating additional traffic in the vicinity, therefore causing an increase in overall traffic noise levels; and by adding to the noise environment the sounds of mechanical equipment associated with the building.

The amount of traffic generated by the building during any hour of the day would cause noise levels to increase by less than 1 dBA on any of the adjacent streets. A 1 dBA increase in environmental noise is undetectable by the human ear. The cumulative increase in traffic generated by proposed downtown development over the next couple of years is projected to be about 30% south of Market Street (see Chapter II.B., Transportation, page 20). This increase would result in about a 1 dBA increase in environmental noise levels. Hence, from a cumulative standpoint, the noise environment would continue to gradually increase.

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[1]American Society of Heating, Refrigeration and Air Conditioning, ASHRAE Handbook and Product Directory, New York, New York, 1976.

San Francisco's noise ordinance limits the amount of noise mechanical equipment can emit throughout day and nighttime hours.[1] The noise ordinance requires that noise from the mechanical equipment at the proposed building not exceed 60 dBA between 10 p.m. and 7 a.m. and not exceed 70 dBA between 7 a.m. and 10 p.m. at the property line of the property affected by the noise emissions in C-3 zones. This level would be at or below the existing background noise level in the vicinity of the site and no increase in noise levels due to mechanical equipment would be expected.

Construction Noise Impacts

Construction noise in San Francisco is also regulated by the noise ordinance which requires that all powered construction equipment except impact tools and equipment not emit more than 80 dBA when measured at a distance of 100 feet. Impact tools and equipment including pavement breakers, jack hammers, and piledrivers must have both their intake and exhaust muffled to the satisfaction of the Director of Public Works. The ordinance further requires a special permit for construction after 8:00 p.m. and before 7:00 a.m.

Construction of the Spear and Main Street building would take place in 3 phases: excavation, foundation construction, and building erection. Construction noise levels would fluctuate measurably depending on the following variables: the phase of construction, the duration, the type(s) of equipment used during each phase, the noise emitted during its noisy mode of any particular item or items of equipment in use, the proportion of the day during which the equipment would be operated in its noisy mode, the mobility of the equipment (e.g., the noise source might be a

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[1]San Francisco Municipal Code, Section 2909, Fixed Source Noise Levels, 1972.

stationary air compressor or a self-propelled backhoe), the distance between the noise source and the receptor, and the noise propagation characteristics of the path between the noise source and the receptor (e.g., shielding by a barrier or intervening building would result in a reduced noise level at the receptor). The worst-case noise impacts associated with the various phases of construction have been estimated.

During excavation and site leveling, bulldozers, graders, haul trucks and front-end loaders would be expected on the project site. These pieces of equipment generate from 64 to 79 dBA at 100 feet. Twenty to 30 trucks per day would enter and leave the site for a period of about 2 weeks during the excavation and site leveling phase. During foundation construction, the major noise source would be pile driving, which would last about 3 weeks. During pile driving, noise levels of approximately 105 dBA at 50 feet could be expected. After the pile driving phase, concrete pumpers, power saws, cranes, air compressors, engine generators and impact torque wrenches would be the major noise sources. These pieces of equipment emit from 70 to 95 dBA at 50 feet. The impact wrenches emit the highest noise levels of 95 dBA at 50 feet, as measured in downtown San Francisco. The impact wrenches would be used intermittently during the framing of the building.

The occupied land uses nearest the construction site are buildings located at 120 (Borel Building) and 180 Howard Street (Howard and Main Building) south of the site and a brick building located north of the site on Main Street. The Rincon Annex Post Office is located across Spear Street from the site. The 120 and 180 Howard Street buildings appear to have about 75% glass facades. These buildings are within about 25 feet of where piles would be driven. At this distance, noise levels outside the buildings could reach about 110 dBA during pile driving. Noise reduction provided by these buildings is estimated to be about 25 dBA which would result in pile driving noise levels of about 85 dBA inside the buildings. Office workers would not be able to

carry on a conversation, would not be able to use the telephone and would be distracted from their work and would probably complain to the management. In addition to the noise levels generated by this activity, vibration levels would be great enough to shake the building. Pile driving sound levels in the brick building to the north of the site would be about 75 dBA inside. Sound levels in the Rincon Annex would be expected to reach about 70 dBA inside. These levels would be high enough to distract office personnel from their work.

During the use of impact wrenches directly outside the adjacent Howard Street buildings, noise levels could reach 100 dBA outside and about 75 dBA inside. This activity would be sporadic but workers in offices nearest the noise source would not be able to use the telephone or carry on a conversation when the impact wrenches would be in use.

Trucks going to and from the construction site would not be expected to generate sound levels higher than existing truck and bus traffic in the area. The construction truck traffic would not result in a measurable change in the average noise environment in the area.

E. VISUAL QUALITY AND URBAN DESIGN

The pedestrian walkway extending from the building lobby to Spear Street would contain curves defining the edge of planted areas containing trees, shrubs and groundcovers and appear as an informal garden entry to the east side of the building. The entry, consisting of the walkway and planted areas would be about 46 feet wide and visually serve as open space between the 150 Spear Street buiding and Howard and Spear Street office building. A principal purpose of the landscaped entry would be to provide visual interest to occupants of the building's upper floors and adjacent structures.[1]

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[1]Cathal O'Doherty, project director, Jorge De Quesada, Architects, personal communication, 17 September 1980.

The corners of the building would be truncated, set at a 45° angle to the building sides. The truncated building corners would be reflected in the angled form of 4 bays extending 3 feet on the building side facing Main Street (Figure 10, page 14). A similar extension of the building's face would occur on the opposite side of the structure, but would consist of 1 broader element rather than 4 elements. These extensions on 2 sides of the building would serve to break up the perceived mass of the structure, as defined by its width, length and height, creating visually apparent building sections comprising the total form of the structure. Vertical columns extending 2 stories in height around the building's perimeter would be exposed on 4 sides, visually defining a base on which upper floors of the building would appear to be situated (Figure 4, 5, 6 and 7, pages 7, 8, 9 and 10).

A horizontal line of windows at each floor (from the 3rd level up) would distinguish each level to the observer. The spandrels[1] would be fabricated of precast concrete panels containing dark red brick tile on the exterior surfaces, adding visual interest to the building while reducing apparent building mass. Vertical columns that support the building would be visible (exposed)on one side (the building face), relieving the horizontal appearance of windows and spandrels.

Visual interest to pedestrians would be provided by retail shops with windows for viewing the building's interior at ground level and through the use of textured surface paving beginning from the building's entry at Main Street, extending through the lobby and continuing along the plaza to Spear Street. Decorative, shade tolerant plantings of the plaza and a multiple level waterfall/fountain would also provide visual interest to pedestrians near the structure's Spear Street

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[1]Spandrel: In a multi-story building, a panel-like area between the top of a window on 1 level and the sill (base) of a window in the story above.

entry. Street trees would be provided along the Main Stret frontage and along the pedestrian walkway adjacent the east side of the building.

There are a number of policies contained in the Urban Design Plan of the San Francisco Comprehensive Plan that would relate to the project area and the proposed building.[1] The Urban Design Plan is meant to serve as a guide to new development, so that the physical environment is not be abruptly or severely disrupted.

Conservation Policy 6: " Respect the character of older development nearby in the design of new buildings."[2] The proposed structure would be similar to new construction, which typifies an unornamented treatment of building exteriors and repeated use of a common floor plan expressed on the outside by uniform window placement and spandrels of uniform dimension. The building spandrels would be surfaced with brick tile, reflecting the use of brick on older, lower structures constructed in the area during previous decades and the use of brick on the adjacent Borel and Howard and Main Street Buildings (figures 17 and 18, pages 41 and 43).

Major New Development Policy 6: "Relate the bulk of buildings to the prevailing scale of development to avoid an overwhelming or dominating appearance in new construction."[3]

The mass of the proposed structure would visually relate to the scale, form and proportions of the majority of existing and proposed buildings near the project site, and is generally addressed by Major New Development Policy 6.

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[1]San Francisco Department of City Planning, adopted by Resolution 6745 of the San Francisco City Planning Commission, 26 August 1971.

[2]Urban Design Plan, page 25.

[3]Ibid., page 37.

City Pattern Policy 1: "Recognize and protect major views in the City with particular attention to those of open space and water."[1]

Views from nearby buildings below about the 4th floor are confined to short distances due to surrounding buildings and elevated freeway ramps. The proposed structure would not be expected to block pedestrian views and views from other buildings below the 4th floor level to a greater degree than currently exists. However, at increasing heights in adjacent buildings, views from those buildings would be blocked up to the building's 19th-floor level; the degree of view blockage would vary with respect to observer elevation and location in relation to the project. Generally, the farther away from the project the observer would be located, the less view blockage that would be expected to occur. A reverse condition would also be expected with respect to the proposed structure. Generally, offices on the upper floors of the structure would provide views of the Financial District, San Francisco Bay, Treasure Island, the East Bay Hills and portions of the San Francisco skyline. Because the structure would be located 15 feet from the north face of the Howard and Main Street Building, there would be restrictions in outward views available between both buildings. Also, proposed structures north and west of the project site would block views from the project.

Major New Development Policy 9: "Encourage a continuing awareness of the long-term effects of growth upon the physical form of the City."[2]

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[1]Urban Design Plan, page 10.

[2]Ibid., page 40.

City Pattern Policy 3: "Recognize that buildings, when seen together, produce a total effect that characterizes the City and its districts."[1]

As noted, the building would be seen from vantage points throughout the project area. The building would be visible from the west end of the Bay Bridge span (see Figure 22, page 82). Cumulatively, the structure would contribute incrementally to the total mass of buildings defining the San Francisco skyline. The structure would be seen as a new element taking its place in the City's emerging urban form comprised of taller buildings over an increasing land area including the Financial District and South of Market area. The structure would be seen as one element in a group of highrise buildings defining the higher skyline along Market Street and the Financial District.

Current trends indicate that future development of land adjacent or close to the project site would consist of buildings taller than the existing older structures they would replace. New structures would be seen to extend the existing Financial District highrise development pattern north of the project area, closer to the project site and block views to buildings of the Financial District from the west end of the Bay Bridge. It would be expected that the proposed structure would be visually absorbed, in varying degrees through time, into the City's skyline profile.

F. SOILS AND SEISMICITY

1. Soils

Due to the relative lack of strength and stability of underlying soils, the proposed building would be constructed on piles. Pile foundations which penetrate through the soft mud to stronger material would reduce or eliminate vertical settlement of the structure. However, lateral movement of the

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[1]Urban Design Plan, page 10.

View toward Project Site from West End of Bay Bridge Span

Figure No. 22

soft mud layer, or settlement, could subject the piles to overloading by downdrag forces in addition to the building loads.

Prior to the construction of some buildings, dewatering of the ground to below the foundation is required. Groundwater can loosen sands and soften clays, resulting in hazardous excavation. Dewatering of the ground by pumping could cause settlement of soils on the site and in neighboring areas, damaging existing buildings, streets, sidewalks and utilities if mitigation measures were not implemented. Because the exact depth to groundwater at the project site has not been determined, it is not yet known if dewatering would be required for basement construction.

2. Seismicity

Seismic activity on a major fault in the San Francisco Bay Area could cause hazards to the human environment. If proper design of foundation and structure were not implemented, major building structural damage or collapse could occur due to ground-shaking and ground failure. Liquefaction[1] is also a potential hazard on the site.

If a severe earthquake, such as the 1906 San Francisco earthquake of estimated Richter magnitude 8.3,[2] were to occur along the San Andreas Fault in the Bay Area, violent ground-shaking would occur. The project site is located on zone B on the map "Estimated Intensity of Future Groundshaking" (see Figures 23a and 23b, pages 84 and 85).[3] Groundshaking, which is

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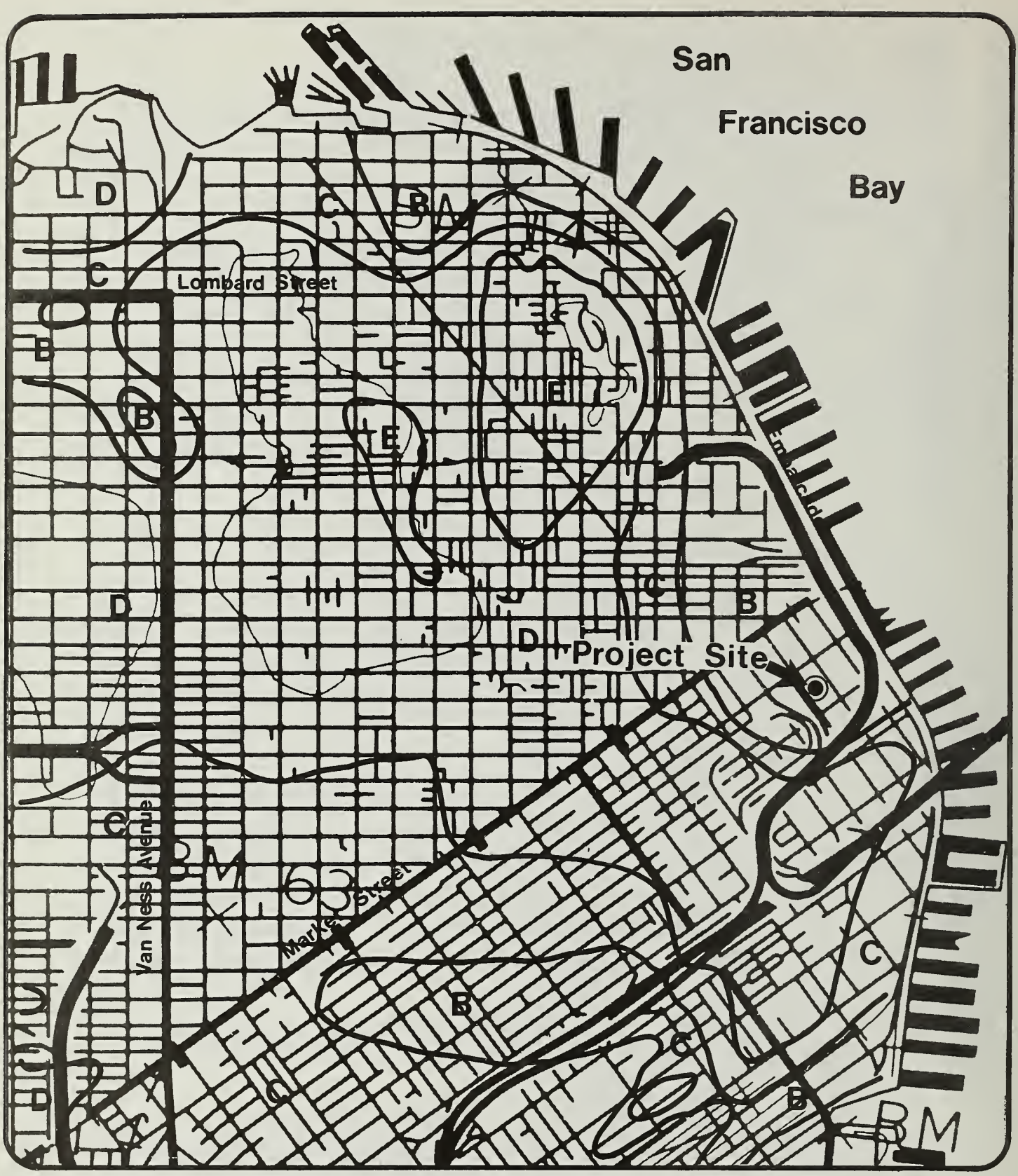
[1]Liquefaction: Earthquake-induced transformation of a stable granular material, such as sand, into a fluid-like state, similar to quicksand.

[2]Richter Scale: A logarithmic scale developed by Charles Richter to measure earthquake magnitude by the energy released, as opposed to earthquake intensity as determined by effects on people, structures, and earth materials.

[3]URS/John A. Blume, "San Francisco Seismic Safety Investigation," prepared for the Department of City Planning, City of San Francisco, June 1974.



Estimated Intensity of Future Ground Shaking

(Refer to Legend, Figure 22b)

North

0 1,000 2,000 4,000

Scale Feet

Source: San Francisco Seismic Safety Investigation, John A. Blume & Associates, June, 1974

Figure No. 23a

A Very violent. Cracking and shearing of rock masses. Deep and extended fissuring in soil, many large landslides and rockfalls.

B Violent. Fairly general collapse of brick and frame structures when not unusually strong. Serious cracking of better buildings. Lateral displacement of streets, bending of rails and ground fissuring.

C Very strong. Masonry badly cracked with occasional collapse. Frame buildings lurched when on weak underpinning with occasional collapse.

D Strong. General but not universal fall of brick chimneys. Cracks in masonry and brick work.

E Weak. Occasional fall of brick chimneys and plaster.

NOTE: Intensities are given for earthquakes similar to the 1906 event in Magnitude and proximity to San Francisco.

Legend:

Estimated Intensity of Future Ground Shaking

Figure No. 23b

caused by ground-transmitted seismic waves, would be expected to be of high intensity due to wave amplification in soft, unconsolidated soil (hence, the "B" zoning designation on Figure 23a). Violent groundshaking indicates general collapse of weakly built brick and frame structures; well-constructed buildings would be subjected to serious cracking; and there would be lateral displacement of streets, bending of rails, and ground fissuring.[1]

One possible secondary effect of groundshaking would be lateral spreading, which results from loss of strength in fine-grained, cohesive materials, and manifests itself in squeezing of soft, saturated clays such as Bay mud. Spreading can cause rapid or gradual loss of strength in foundation materials, and structures can either gradually settle or break up as foundation soils flow laterally. Where Bay muds become more consolidated, this effect would lessen in severity.

Lurching is another secondary effect of groundshaking. It occurs when large amplified waves from an earthquake result in surface cracks in relatively stiff fill overlying Bay mud. During the 1906 earthquake, lurching was a prominent feature in the tidal mud flats of Tomales Bay and in the uncontrolled fills of downtown San Francisco. Where the Bay muds reach equilibrium under the weight of the fill, the likelihood of lurching would decrease.

The project site is located in an area of liquefaction potential.[2] Liquefaction could result during violent ground motion in saturated, cohesionless sands and sandy fill materials, but is not a major hazard in cohesive Bay muds.

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[1]URS/John A. Blume, "San Francisco Seismic Safety Investigation," prepared for the Department of City Planning, City of San Francisco, June 1974.

[2]Ibid.

The susceptibility of the natural soils in the vicinity of the proposed project site to compaction, liquefaction or internal disintegration during an earthquake is considered relatively low.[1] The loose, partially saturated fill could, however, be subjected to such hazardous phenomena during a major earthquake as occurred in the project area during the 1906 earthquake.[2]

3. Tsunamis

Tsunamis, or great sea waves, can be generated by any large-scale, short-duration disturbance of the ocean floor.[3] An undersea earthquake of Richter magnitude greater than 6.5 and focal depth of less than 32 miles is capable of causing a tsunami.[4] Since tsunamis usually effect the California coast as rapidly changing tides,[5] the proposed project would be in greater danger from flooding than from impact force of a great wave.

The maximum projected runups (rise in water level) at the project site are 5.0 feet for the 100-year flood and 8.4 feet for the 500-year flood above Mean Sea Level.[6] If either occurred during high tide each would be up to 2.5 feet higher. The 100-year, high tide runup would cause up to 0.5 feet of flooding at the site. The 500-year, high tide runup would cause between 2 feet and 4 feet of flooding at the site.

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[1]Lee and Praszker, "Geotechnical Input, for EIR, 101 Mission Street, San Francisco," July, 1980.

[2]Ibid.

[3]American Geological Institute, Glossary of Geology, Washington, D.C., 1980.

[4]Pierzinski, Diane, "Tsunamis," California Geology, Sacramento, California, March 1981, page 58.

[5]Ibid, page 59.

[6]Garcia, A. and L. Houston, Type 16 Flood Insurance Study, U.S. Army Corps of Engineers Tech. Rept. H-75-17, November 1975, Figure 56.

G. HISTORICAL RESOURCES

According to a reference document on the San Francisco Waterfront,[1] earth fill of the Bay in the project area during the post-Gold Rush period has been found to be historically valuable because of the sunken hulks contained in the fill. There is a map contained in the reference library of the Maritime Museum titled Gold Rush Vessels Beached, Scuttled, or Broken Up, which was prepared through archival research about 1964 by Karl Kortum, Museum Curator, and staff members Harlan Soetan and Alfred Harmen.[2] Inspection of the map shows that most buried hulks are located in the vicinity of Telegraph Hill, and that others are known to exist along the waterfront. A hulk labeled "Supply Ship" is shown with the stern located under the intersection of Mission and Main Streets and the bow pointing slightly to the west further north on Main Street just past the intersection. No buried hulk is shown to be located on the project site or the block.

About 12 feet of excavation would be required to construct the new building. It is not possible, based on the existing record, to rule out the possibility of encountering historical resources or a buried hulk (or a portion thereof) during excavation for the proposed structure.

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[1]Roger and Nancy Olmsted, The San Francisco Waterfront: Report on Historical Cultural Resources, prepared for Wastewater Management, December 1977.

[2]The map is currently being prepared for publication, although a publication date has not yet been set. Copyright: San Francisco Maritime Museum. Source: Justine Shultz, Museum Librarian, telephone conversation, 29 April 1981. The map has not been revised since 1964, and ships not shown on the map have been discovered during excavation for other buildings.

H. COMMUNITY SERVICES

1. Police

An increase in office space and employment in the project area could increase the number of petty theft incidents. However, it is not anticipated that the proposed project would place an additional demand on police services, and patrols would not be increased. The cumulative effect of growth South of Market may eventually necessitate a foot-patrol in the project area.[1] The Moscone Convention Center, located between Folsom, Howard, 3rd and 4th Streets, would be located about 5 blocks from the project site. Completion of the Convention Center may require additional personnel due to the presence of convention attendees.

2. Fire

Annual consumption of water from the high-pressure fire-fighting line would be limited to sprinkler flow alarm testing unless there were a major fire in the proposed building. Self-contained fire and life safety systems consisting of sprinklers, alarms and smoke removal systems would be provided as required by Section 1807 of the San Francisco Building Code.

Implementation of the project could generate more resuscitation (rescue and first aid) calls than previously experienced at the site. The proposed project would not require additional manpower or equipment.[2] However, increased highrise development could cumulatively generate a need for more fire protection services.

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[1]Paul Libert, Officer, Planning and Research, San Francisco Police Department, telephone communication, 3 November 1980.

[2]Eugene Calamoneri, Captain, Planning and Research, San Francisco Fire Department, telephone communication 3 November 1980.

3. Water

Current average daily water use in San Francisco is 80 million gallons per day. At full occupancy the project would consume approximately 32,600 gallons per day by the building's occupants,[1] and up to 500 gallons per day for site landscaping during summer months. The presence of a 20-inch water transmission line beneath Main Street indicates there are sufficient water and distribution facilities for numerous potential consumers in the area. Water pressure and supply are adequate to serve the proposed project. The Water Department anticipates no difficulty in providing service to the site or other proposed developments in the area.[2]

4. Sewer

At full occupancy wastewater flows generated from the domestic uses of the project would be expected to be approximately 32,600 gallons per day. Sewer loads from cooling tower bleed and from landscaping would not be measurable. All sewage generated by the project would be transported to the Northpoint Water Pollution Control Plant where sewage flows receive primary treatment.

The San Francisco Department of Public Works considers the sewer system in the project area to be adequate to handle the wastewater generated by the project and other proposed

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[1]Brown & Caldwell Consulting Engineers, 1972, Report on Wastewater Loading From Selected Development Areas, as cited in San Francisco City Planning Commission and San Francisco Redevelopment Agency, 1978, Final Environmental Impact Report/ Yerba Buena Center EE 77-220, certified 25 April 1978 (office use of 125 gallons per 1,000 square feet of usable floor space and retail use of 200 gallons).

[2]George Nakagaki, Assistant Manager, San Francisco Water Department, City Distribution Division, personal communication, 3 November 1980.

buildings with the replacement and expansion of sewer lines in the project vicinity at the close of 1981.[1]

5. Solid Waste

The proposed project is anticipated to generate about 1½ tons of garbage per day. Current facilities of the Golden Gate Disposal Company could accommodate the additional load. The disposal company recommends that sufficient space be designed into the building to allow for a roll-off compactor (30 feet long x 12 feet wide x 18 feet tall). The 8-10 ton capacity compactor would require disposal once a week.[2]

I. ENERGY[3]

1. Construction

A procedure to approximately calculate energy consumed during construction is to use a gross energy consumption/dollar cost ratio.[4] Based on an estimated construction cost of about

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[1]Nat Lee, Engineering Associate, Division of Sanitary Engineering, Department of Public Works, personal communications, 3 November 1980 and 12 November 1980.

[2]Fiore Garbarino, Office Manager, Golden Gate Disposal Company, telephone conversation, 26 June 1981.

[3]The analysis of energy consumption was based on the proposed building containing a gross interior floor area of 306,500 square feet. The current revised proposal is for a structure containing about 3% less gross square feet than the original proposal. The floor area change does not require changes in the calculation of energy consumption because the figures fall within the ± 10% level of statistical validity of the methods used to predict energy consumption. The consumption of energy per square foot of floor area in the analysis remains the same.

[4]Tetra Technology, Inc., Energy Use in the Contract Construction Industry, Arlington, Virginia, 1975.

$23.5 million, it is estimated that about 61.2 billion BTU[1] of energy would be consumed during construction of the proposed project. This is equivalent to about 11,300 barrels of crude oil.[2]

2. Operation

The gas and electrical consumption estimates for the proposed structure are based on a computer analysis that was completed by Crichfield Mechanical Incorporated for a recently designed building that has similar design features as the proposed building. The computer model used is based on the assumption that natural gas would be used for space heating and domestic water heating and that electricity would be used for lighting and air conditioning. It was further assumed that the structure would comply with the requirements of Title 24 to the California Administrative Code regarding insulation, maximum lighting loads, building temperature and other energy conservation features.[3] The results of the analysis are based on the following design features being incorporated into the structure.

- All exterior walls and the roofs would be insulated.
- Tinted glass would be used in the windows.
- A lighting load of 2.75 watts per square foot.
- Drapes on the south side of the structure would be drawn on warm sunny days.
- The structure would incorporate a cooling system.
- Each floor would have an individual air handling unit.
- A heating system would be used to primarily heat perimeter areas.
- Nighttime and weekend building temperatures would be automatically set at 60 degrees Fahrenheit.

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[1]BTU= British Thermal Unit. The quantity of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit at about 39 degrees Fahrenheit.

[2]Environmental Impact Planning Corporation, Energy Impact Handbook, San Francisco, 1976, Table C-10f.

[3]California Energy Commission, Conservation Division, Regulatories Establishing Energy Conservation Standards for New Residential and New Non-residential Buildings as Amended July 26, 1978, Sacramento, 1978, Table 2-1.

a. Electricity. The project's estimated average monthly electrical consumption would be about 260,000 kilowatt hours (kwh), equivalent to 0.85 kwh per square foot of gross floor space. Estimated electrical consumption curves are given in Figure 24, page 94. Because tenant use of computers has not been determined, final electrical consumption cannot be precisely determined until the tenants are known.

b. Natural Gas. The estimated average monthly natural gas consumption for the proposed project is 184 BTU per square foot of gross floor space. The magnitude of the estimated peak natural gas demand for the project is 25 therms[1] per hour. Estimated gas consumption curves are given in Figure 25, page 95. Because space heating requirements would vary with the tenant office furnishings and equipment, final gas consumption cannot be precisely determined until the tenants are known.

Title 24 regulations set a maximum allowable energy consumption for non-residential buildings with an occupancy of over 300 persons of 126,000 BTU per gross square foot of heated and cooled floor space per year. Using the electrical and natural gas consumption figures presented above, the estimated annual energy consumption for the proposed project would be 107,000 BTU per gross square foot of floor space. This is an estimate, however; final compliance would be determined by computer analysis as a prerequisite to the issuance of a building permit.

3. Transportation

Based upon transportation estimates of trip generation and destination (see Chapter III.B., page 55), the daily regional increase in Vehicle Miles Traveled (VMT) due to the project is estimated at 41,000 , equivalent to 10.3 million miles annually. The annual auto transportation

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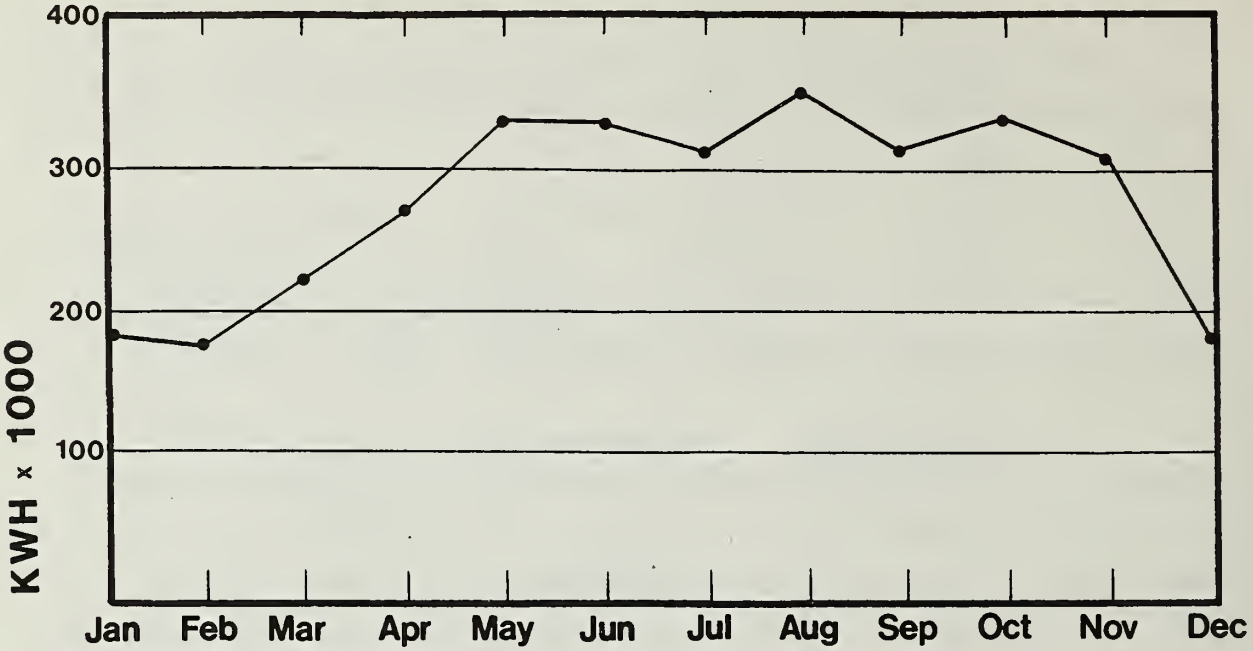
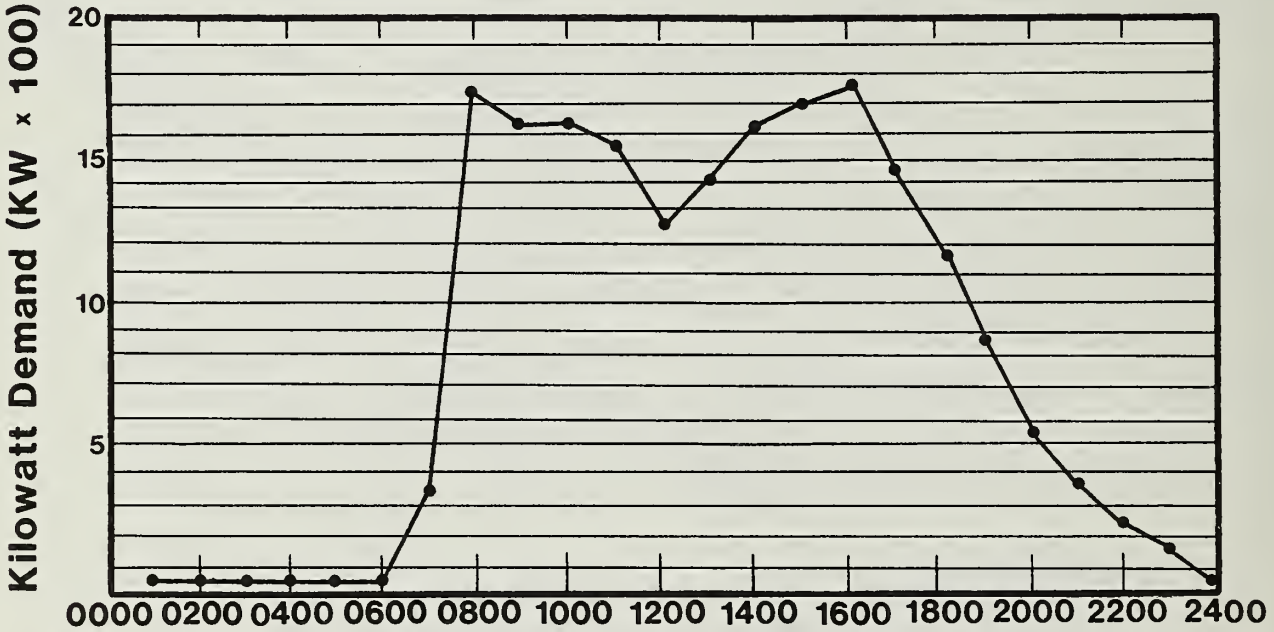
[1]Therm = 100,000 BTU.



Monthly Consumption

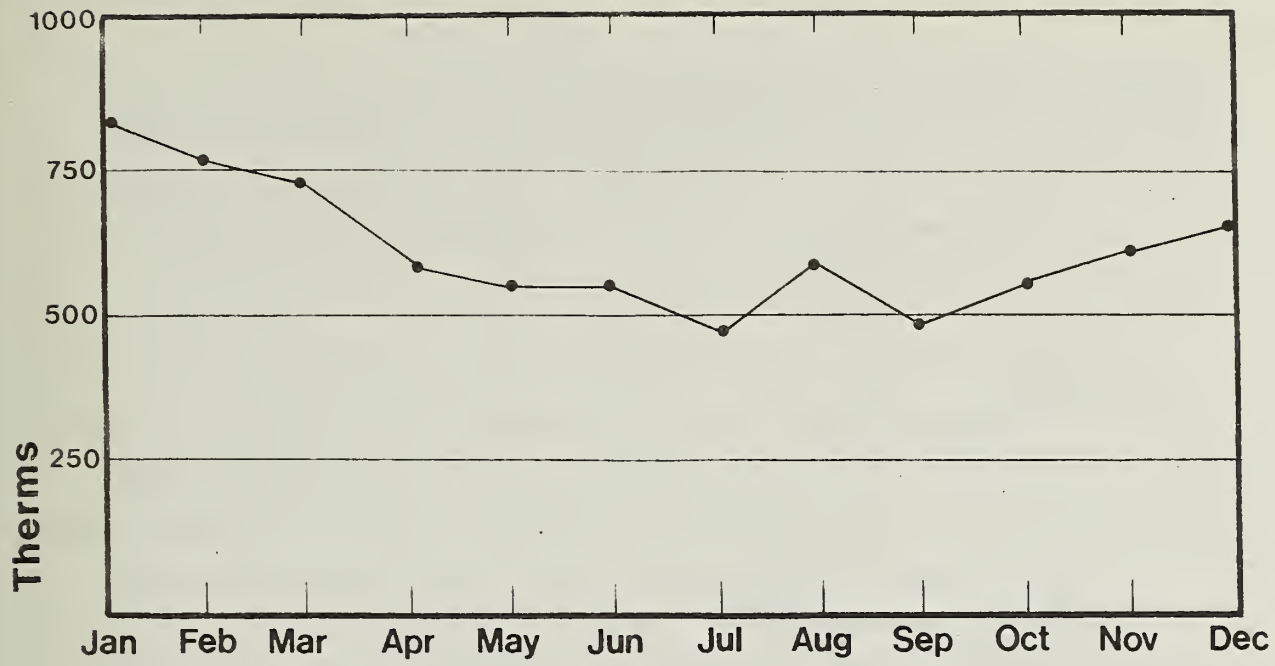


Hourly Consumption-September Peak Demand Day

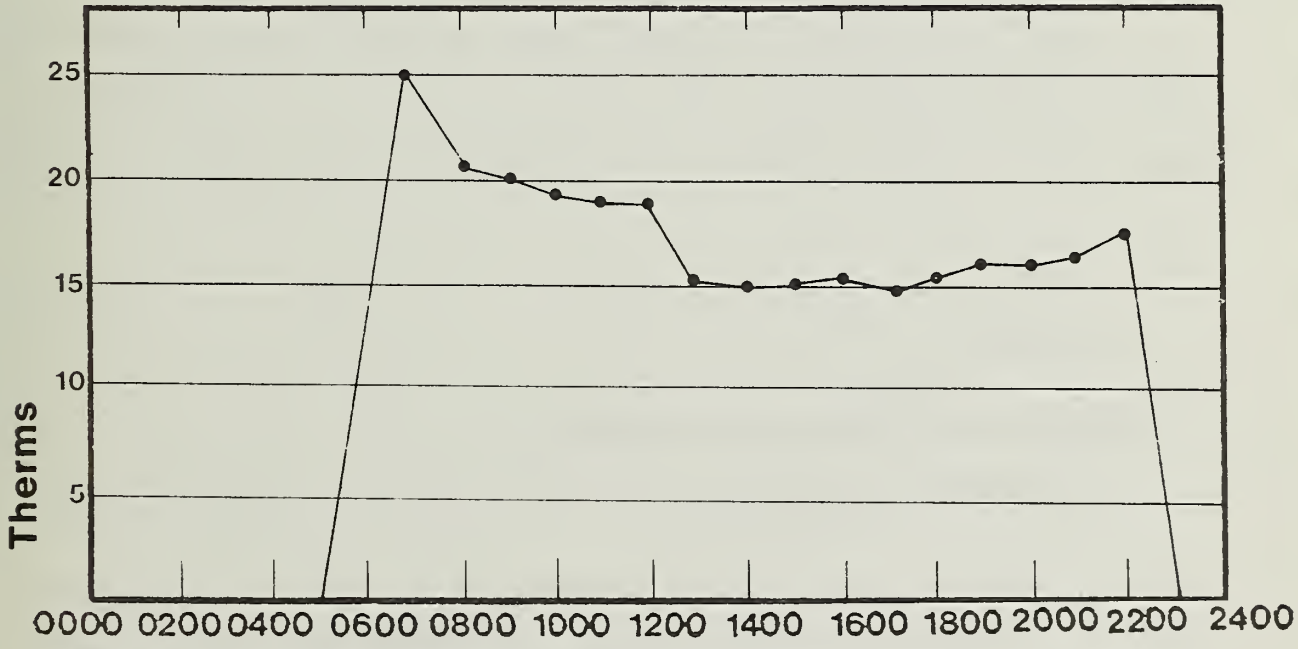
Estimated Electrical Consumption

Source: EIP Corp.

Figure No. 24



Monthly Consumption



Hourly Consumption-January Peak Demand Day

Estimated Gas Consumption

Source: EIP Corp.

Figure No. 25

energy consumption associated with the VMT increase would be approximately 520,000 gallons of gasoline equivalent to 64 billion BTU per year. Energy consumed for bus, rail and ferry transit occupants of the building would be in addition to the above quantities.

4. Removal

Building demolition activities require about as much energy as construction activities. Therefore, demolition techniques in the future remain similar in their energy use to construction energy use, as currently is the case, then the energy cost of building removal at some point in the future (perhaps 50 years or more), would be about 61 billion BTU.

5. Lifetime Energy Costs

Assuming a potential 50-year lifetime for the building, the estimated lifetime energy cost (includes construction, operation, transportation and removal) would be about 4 trillion BTU. This is equivalent to approximately 31 million gallons of crude oil.

J. ECONOMICS

1. Economic Activity and Employment

Office and Retail Space. The proposed project would add a total of about 271,600 net rentable[1] square feet of office space to the existing downtown supply without demolition of any existing office space. In addition, about 7,460 net rentable square feet would be available for commercial shops.

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[1]Net rentable: gross floor area less stairs, elevators, vertical shafts, emergency corridors, truck loading and unloading area.

The addition of the project would be an increase of less than 1% to the current supply of office space in the Central Business District.

Construction Employment. An estimated $23,500,000 would be spent during construction ($18,000,000 for the shell and $5,500,000 for interior improvements). Assuming labor costs for the shell are about 40% of the total ($18,000,000 x 40% = $7.2 million) and labor costs for the interior are about 50% of the total ($5,500,000 x 50% = $2.75 million) including direct wages, payroll taxes and fringe benefits, about $10 million would be spent on labor.[1] Assuming an annual cost including wages, taxes and benefits, of $28,000 per construction worker, a total of about 360 person years of construction labor would be generated. Project construction would be expected to take place over a 24-month period; therefore, average construction employment would be about 180 full-time jobs at any one time during construction. Peak employment would be about 220 persons. Additional short-term employment in design, engineering, planning, environmental, legal services and marketing also would be generated.

Secondary temporary employment would be generated due to demands for goods and services by construction workers and their families and in the construction materials supply industry. These secondary jobs could be estimated on the basis of a 1 to 1 ratio or 1 secondary job for every direct construction job.[2] This would be the equivalent of 360 full-time 1-year jobs in the region.

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[1]Cathal O'Dougherty, Project Director/Architect, telephone conversation, 25 September 1980.

[2]This construction multiplier has been used for several downtown construction projects in San Francisco, including the Daon Office Building Final EIR, EE79.57, certified 12 June 1980.

Permanent Employment. Employment in the new office building and the pavilion would total about 1,200 persons (including office workers, retail sales clerks, and security and maintenance employees).[1]

The project sponsor intends to lease to tenants with large clerical and technical staffs so that each floor may be leased to a single tenant (e.g., engineering or architectural firms, government agencies, insurance companies).

Rents. Office space in the proposed Spear and Main Building would be expected to rent from about $2.50 to $3.30 per square foot per month, or $30 to $40 per square foot annually. Current rates for office buildings in the downtown area range from $20 to $40 per square foot annually.[2]

2. Fiscal Revenues and Costs

Assessed Valuation and Property Tax. Based on replacement costs, the minimum fair market value of the proposed project would be approximately $28.7 million in 1980 dollars.[3] Assuming the property would be assessed on the basis of the full replacement costs, the assessed value of the project would be the estimated fair market value. Total annual property tax would be $287,000 at 1% of full value allowed under Proposition 13 (or $4.00 per $100 assessed value), plus an additional levy for the repayment of existing bonds previously approved by the electorate (the current total rate for the 1980-1981 fiscal year is $4.92 per $100 assessed value) leading to a total of $356,000. It is not known at present how the property

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[1]Based on 1 employee per 250 rentable square feet of office space, 1 sales worker per 300 square feet of commercial space, and 1 security and maintenance worker per 12,500 square feet of space.

[2] J. Stanisch, Senior Real Property Appraiser, Assesor's Office, City and County of San Francisco, telephne communication, 13 July 1981.

[3]Full replacement cost estimates include the interim financing and leasing costs as well as construction costs. See Appendix D, page A-23.

taxes would be distributed in the fiscal year 1983-1984 (estimated year of completion) under the provisions of Assembly Bill 8 and Proposition 4. Applying the 1980-1981 rate, San Francisco could receive from $244,000 to $303,000 from the project (85% of the total composite property tax revenues). Subtracting the market value of the existing land and improvements which total about $506,000, the net addition of the San Francisco property tax base would be about $28.2 million. The net increase over existing composite property tax revenues to San Francisco would be between $218,800 to $277,800.

Other Local Revenues. The project would generate new payroll, business, sales and utility users taxes which would accrue to San Francisco; Table 10, page 100, is a summary of estimated project-generated tax revenue.

Potential increased revenues to San Francisco could range from $394,000 to $461,900; however, this range is subject to a number of variables that could affect the estimate:

- Property tax distribution could change in the ensuing years.
- Payroll tax could vary according to the salaries of the employees in the proposed project.
- The estimated volume of sales in the restaurant and shops could change.
- Rents could increase, thereby affecting the gross receipts tax.
- Costs for utilities, particularly telephone, gas and electricity, are also variable.

In addition, there are indirect revenues that could accrue to San Francisco in the form of sales tax from items

TABLE 10

Estimated Project Revenues at Full Occupancy
(1981 dollars)

	Current Revenues	Total	Gross City/County[1]	Net City/County
Property Tax[1]	$25,200	$287,000 to 356,000	$244,000 to 303,000	$218,800 to 277,800
Payroll Tax[2]	-	130,700	130,700	130,700
Sales Tax[3]	-	98,000 to 114,400	15,000 to 17,600	15,000 to 17,600
Gross Receipts Tax[4]	-	18,400 to 24,600	18,400 to 24,600	18,400 to 24,600
Utility Users Tax[5]	-	11,300	11,200	11,200
	$25,200	$545,300 to 636,900	$419,300 to 487,100	$394,000 to 461,900

[1]Assumes property tax distribution as in 1980-1981; it may be slightly different in the ensuing years. The San Francisco Unified School District and Community College District, Bay Air Quality Management District and BART would also receive property tax revenues. The ranges are based on 4% (under Proposition 13) and 0.97% (based on bond payments), which will change in several years.

[2]Estimated on 60% of employee wages eligible, average annual salary of $18,000 and 1.1% tax (1981 rate).

[3]Estimated on 6½% of sales tax; San Francisco collects 1%.

[4]Based on net rentable space at $30 to $40 per square foot at the rate of $2.20/$1,000 of gross rental receipts.

[5]Water. The estimated annual water bill for the completed project is $18,800 ($1,202,000 cubic feet/year @ 41.4¢/100 cubic feet, plus $1.15 sewer service charge/100 cubic feet). Tax @ 5% = $940.00

PG&E. The total annual PG&E bill is estimated at: $141,400 for electricity (@4.5¢.kwh) and $2,000 for gas (@29¢/therm). Totals based on annual comsumption figures projected in Section III.I, Energy Impacts. Tax @ 5% = $7,200.00

Pacific Telephone. The estimated annual telephone bill is $51,500, a figure which would vary considerably with the type of office tenant. This estimate assumes a monthly telephone bill of $1,000/5,000 leasable square feet. Tax @ 5.5% = $3,100.00

Total Utility Tax = $11,200.00

purchased by those employees at the proposed project who are filling new jobs in San Francisco (i.e., people obtaining employment in San Francisco for the first time).

Municipal Costs and Net Revenues. Costs to San Francisco for providing municipal services to the proposed project are difficult to quantify. Existing services near the site can accommodate the proposed project without additional facilities and/or manpower, assuming that the project is constructed in accordance with the public codes. Existing public works costs for street repair, drains, lighting and cleaning would not measurably increase. Police and fire protection costs would not increase due to the proposed project[1]; however, cumulative costs could increase due to servicing downtown growth. User charges for water and sewer would cover the cost for the expansion of such services.

Cost increases would be expected for the MUNI, SamTrans, BART and Golden Gate Transit. Capacity increases are based on the anticipated revenues projected by the transit districts. Estimated costs to the MUNI system could be approximately $81,000 annually.[2]

If more than the historic proportion of General Fund revenues were allocated to MUNI, it could be assumed that the proposed project revenues would exceed municipal

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[1]Paul Libert, Officer, Planning and Research, San Francisco Police Department, telephone conversation, 3 November 1980; and Eugene Calamoneri, Captain, Planning and Research, San Francisco Fire Department, personal communication, 3 November 1980.

[2]Based on 1,440 rides per day (28.8% of the 5,000 daily person trips, i.e. the percentage of total p.m. peak hour trips made by MUNI) multiplied by $0.235 (the amount of General Fund support for each MUNI trip), multiplied by 240 working days per year = $81,216.

All levels of MUNI service can be affected by the level of General Fund revenues, the implementation of the transit development impact fee (the enabling legislation is currently in litigation and the area of the City that could potentially be affected is presently being determined) which could generate about $1.36 million as a 1-time fee for the project, and use of flex-time by offices and other measures to mitigate transit use impacts.

costs directly attributed to the project at the time of occupancy. Due to limitations imposed by Proposition 13 on property tax increases, revenues may not increase proportional to inflationary increases in City costs.

Cumulative fiscal effects of development in the downtown area are difficult to quantify due to limited data available. Several studies have been done by various experts and results differ, depending on assumptions used. A summary comparison of the studies is provided in Appendix D, page A-24. The conflicting opinions have not been resolved as of the publication date of this EIR.

3. Employment and Housing

Not all the new employees generated by the proposed Spear and Main Office Building would be new to San Francisco; however, in a worst-case analysis, all 1,200 estimated employees may seek to move to the City. Housing availability in San Francisco is becoming more scarce, particularly as housing costs increase and demand for units escalates with new office buildings creating more employment.

Table 10A, page 102a, is an estimate of the number of Spear and Main employees able to afford various monthly housing costs. The data are based on the assumption that all the employees are part of households and the actual availability of the housing is not considered. All employees could afford to rent the median studio apartment in the City, and 70% of the total (850 employees) could afford to find a 1-bedroom apartment or larger. About 17% could afford to purchase a new house, but approximately 77% (920 employees) would be able to afford the purchase of an existing condominium unit.

K. GROWTH INDUCEMENT

The new office space in the project would be available for relocation or expansion of other San Francisco firms, for firms relocating from outside San Francisco, or for newly forming firms. The project sponsors seek tenants with both professional and upper management staff with clerical and technical support staff.

TABLE 10A

Estimated Number of Office Worker Households Able To Afford Various Monthly Housing Costs for the Spear and Main Office Building (Based on 1980 data)

Housing Type (Rental)	Median Monthly Cost	Number of Spear and Main Employees	% Able to Afford Cost
Studio Apartment	$ 292	1,200	100
One Bedroom	382	1,030	86
Two Bedroom	572	920	77
Three or More Bedrooms	670	850	71
All Rental Units	490	960	80
(Purchase)			
New Single Family	1,307	200	17
New (unit in) 2-4 Unit Bldg.	866	400	34
Existing Single Family	906	370	31
Existing (unit in) 2-4 Unit Bldg.	583	920	77

Source: EIP; Based on information in Tables 5a and 5b, pages 52a and 52b.

Note: The above table assumes that all employees are part of households and does not reflect availability of housing, just the affordability.

The project would represent an additional growth of less than 1% to the existing high-rise office space in downtown San Francisco.

Approximately 1,200 employees (including office, managerial, retail sales, maintenance and security positions) could ultimately be located in the new building. To the extent that the project attracts new residents or commuters who would not otherwise have been attracted to San Francisco or the Bay Area, it may be viewed as employment-generating and growth-inducing, and would result in a variety of indirect growth effects. Because of an increased population, these effects would include additional demand for housing, increased demands for a variety of commercial, social, medical and municipal services, and increased use of streets, freeways and transit systems.

With respect to impacts on the existing housing supply in San Francisco, net new office employment in the City requiring additions to the existing housing supply resulting from a particular project could be analyzed in several ways. The project's effects have been analyzed as gross impacts; that is, the future with the project is compared directly to the present without the project. It is estimated that about 40%[1] of downtown office employees reside in the City. Using this estimate the proposed project would create a demand for about 259 households in the City calculated as follows: approximately 291,000 gross square feet of office space ÷ 250 square feet per employee = 1,164 employees x 40 percent (those who would reside in San Francisco) = 466 employees ÷ 1.8[2] (av. no. of employed persons per downtown San Francisco household) = 259 dwelling units.[3]

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[1]Pacific III Final EIR, EE 80.315, Certified 2/26,81; Five Fremont Center Final EIR, EE 80.268, Certified 12 March 1981; 101 Montgomery Street Final EIR, EE 80.26, Certified 7 May 1981.

[2]Ibid.

[3]Ibid.

Objective 5 of the Residence element of the San Francisco Comprehensive Plan, Maximize Housing Choice,[1] contains a number of policies concerning housing opportunities suitable for persons with special housing needs and of varied lifestyles.[2]

In the discussion under Policy 6, it is noted that: "The City should develop and use incentives to encourage private construction of new units and rehabilitation of existing units suitable for occupancy by the households described in this policy."[3]

The proposed project would create an incremental demand for housing in the City as noted previously. It is also the cumulative construction of a number of downtown office buildings that generates cumulative demand for housing in the City.

The project would require no new construction or extension of utility systems and would occur in an already developed downtown urban setting. It would therefore not require any infrastructural improvements that would open or intensify development opportunities that do not already exist.

The project would continue the trend of intensifying office uses in the downtown, specifically south of Market Street. Together with other new office development near the site, it could stimulate further office growth in the immediate vicinity, on lots now used for parking or in low-rise structures containing business services (such as warehousing). Employee purchasing power could stimulate employee-oriented retail activity in the site vicinity.

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[1]City and County of San Francisco, Department of City Planning, The Comprehensive Plan, Residence, adopted by Resolution 7417 of the San Francisco City Planning Commission, 11 December 1975; page 18.

[2]Ibid.

[3]Ibid, page 20.

CHAPTER IV

MITIGATION

A. TRANSPORTATION

Although the proposed project would add about 2%± to usage of the transportation system, the cumulative trip generation of other committed downtown development would cause impacts on transportation systems. Although it is beyond the ability of any one development to solve the problems of downtown traffic and transit congestion and parking resources, individual developments can pursue certain mitigation measures privately and eventually participate collectively in a large-scale program to improve the downtown transportation system. The City has recognized the potential role of new development in alleviating transportation system impacts and has suggested some basic mitigation strategies.[1] These are included herein as the first 5 transportation mitigation measures.

1. The project sponsor would contribute to a fund for maintaining and augmenting transportation service, in an amount proportionate to the demand created by the project, through an equitable funding mechanism, if successfully implemented by the City, such as an assessment district which would meet the peak demand generated by cumulative office development in the downtown area.

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[1]San Francisco Department of City Planning, Guidelines for Environmental Evaluation - Transportation Impacts, June 1980 (revised October 1980).

2. The project sponsor would encourage transit use by employees in the proposed building by including the sale on-site of BART and MUNI passes, and promoting an employee carpool/vanpool system in cooperation with RIDES for Bay Area Commuters, or other such enterprises.

3. The project sponsor would, in consultation with the Department of City Planning, request tenant firms to implement a flexible time system for employee working hours. A portion of on-site parking (about 10 spaces) would be made available for carpools and vanpools to aid in reducing peaks of congestion in the transportation system.

4. Within a year from completion of the project, the project sponsor would conduct a survey in accordance with methodology approved by the Department of City Planning, to assess actual trip generation patterns of project occupants, and actual pick-up and drop-off areas for carpoolers and vanpoolers. This survey would be made available to the Department of City Planning. Alternatively, at the request of the Department of City Planning, the project sponsor would provide an equitable in-lieu contribution for an overall survey of the downtown area to be conducted by the City.

5. The project sponsor would participate in any future areawide study of current parking conditions and future needs. If new short-term (or long-term) parking is appropriate in the downtown area, the project sponsor would participate in the equitable funding of such facilities through a special assessment district according to criteria determined by the study.

6. Bicycle parking would not be provided in the basement garage to avoid conflicts between bicyclists and vehicles using

the up/down ramp. Bicycle parking would be provided at ground level on the site at a location external to the building to be determined .

7. The project sponsor would ensure that safe and convenient pedestrian access be maintained throughout the construction period on designated walkways around the project site. To the extent possible, construction equipment and trucks would be parked on the project site. The delivery of equipment, materials, etc., would be restricted during the peak traffic flow periods (7:30-8:30 a.m. and 4:30-5:30 p.m.) and such deliveries would adhere to any truck routing restrictions designated by the City.

8. For pedestrian safety, the project sponsor proposes a bell or buzzer which would sound when vehicles leave the site at Main Street. A single curb cut, in lieu of the 2 curb cuts proposed, to be shared by autos and trucks has been rejected by the project sponsor due to potential circulation conflicts between delivery trucks and automobiles.

9. To facilitate pedestrian movement across Main Street, sidewalk expansion and signal modifications would be made at the Mission/Main Street intersection as a part of the Mission and Main Street project (see Transportation Impacts, page 55). Pedestrian bridges at elevated levels between buildings on the project block or crossing local streets have not been proposed for construction at the time of preparing this EIR.

B. AIR QUALITY

The measures discussed in Chapter IV.A. Transportation Mitigation, page 105, would mitigate air quality impacts. These measures would include car-pooling, van-pooling, and staggered work hours.

An effective watering program (complete coverage twice daily) can reduce construction dust emissions by about 50%; the project sponsor would require the contractor to implement a twice daily watering program, which would reduce the likelihood of airborne construction dust and particulates exceeding State and Federal standards.

C. NOISE

Compatibility With the Existing Noise Environment

In accordance with the suggestions in the Transportation Noise Element of the Comprehensive Plan of the City and County of San Francisco, a detailed noise analysis of the noise reduction requirements of the proposed building would be made and needed noise insulation features included in the design.

To mitigate piledriving noise impacts, San Francisco in the past has issued special permits regulating the hours in which piledriving may take place. The project sponsor has agreed to request a special permit from the San Francisco Department of Public Works limiting piledriving to between 1 P.M. and 9 P.M.

In addition to restricting the hours of operation, the City has employed another mitigation measure which has minimized piledriving noise impacts: predrilling the pile holes to minimize

the depth through which the piles would have to be driven. This minimizes the number of flows per pile and therefore the number of noise-generating impacts, and also keeps the pile hammer closer to the ground where shielding due to adjacent buildings is more effective. However, the project's architects specify that the piles that would be used for the project would be "friction" piles (support of the piles would be provided by the sand and alluvium material in contact with the piles), and predrilling pile holes would allow the piles to sink. Therefore, predrilling pile holes would not be provided as a noise mitigation measure.[1]

A wood construction barrier around the project site would be installed and would be effective in mitigating noise levels by up to 15 dBA at the lower floors of nearby buildings. Upper floors would not be shielded by the construction barrier.

D. VISUAL QUALITY AND URBAN DESIGN

A lower building of 4 to 6 floors would avoid obstructing views from the upper floors of adjacent buildings. For economic reasons (to optimize the rate of return of leasable space), the project sponsor is not proposing to construct a structure of lower height containing fewer gross square feet.

In addition to textured surface paving, visual interest to pedestrians would be improved through the use of street trees in front of the building along Main Street and along the interior pedestrian walkways of the block adjacent to the building. Street trees would also serve to improve the scale relationship between the pedestrian environment and mass of the building. Continuity in a street tree theme on the block would be ensured if trees of the project along Main Street were to be of the same species previously installed on Spear and Howard Streets and that would be used for the 101 Mission Building. The project sponsor would see to it that street trees will be coordinated with street tree

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[1]Jorge de Quesada, Inc., Architects, telephone communication to Cathal O'Doherty, project architect, 21 October 1981.

plantings that may be proposed as part of the proposed 115-135 Main Street Building and proposed Main and Mission Street Building. This would be subject to approval by the City as it is required that street trees be located in such a way as to minimize interference with pedestrian traffic.

E. SOILS AND SEISMICITY

1. Soils

Further geotechnical engineering investigations including test borings would be done to determine soil characteristics and thickness; to recommend foundation pile type, pile-bearing length and pile-tip elevation; to predict pile downdrag due to fills overlying compressible soils, expected settlement and possible differential settlement; and to determine if dewatering would be necessary and safe relative to adjacent structures. Results and conclusions of these technical studies would be incorporated into the structural design plans for the proposed building.

Streets would be swept to prevent siltation of storm drains. Soils and demolition debris would be contained on-site for later transportation to dumps.

2. Seismicity

The structure would be designed to meet the seismic design standards of the Uniform Building Code (UBC) and the Structural Engineers Association of California (SEAOC). The latter design standards relate structural design to the maximum probable earthquake in the region, an 8.3 Richter magnitude event along the San Andreas Fault. The elasticity of the structure would be designed according to SEAOC recommended maximum allowable sway. Computer analysis of the structural frame would be performed in order to design the seismic constraint of the structural frame. Such a design

approach would help to minimize damage in a moderate earthquake (magnitude 5.0 to 6.0), and prevent collapse under the maximum probable earthquake.

To reduce seismic hazard, nonstructural elements such as hanging light fixtures, hung ceilings, wall partitions, bookcases and mechanical equipment would be firmly attached to prevent them from falling during an earthquake, as required by the San Francisco Building Code. Emergency procedures would be posted.

F. HISTORICAL RESOURCES

If historical resources are discovered during construction of the proposed project, the contractor would stop work in the area of the find and select a professional archaeologist to permit professional evaluation of the find and determine the appropriate subsequent steps to be taken. The Office of Environmental Review, the President of the Landmarks Preservation Advisory Board, the Director of the Maritime Museum in San Francisco, and the Regional Archaeological Site Survey Office at Cabrillo College at Aptos, California would be notified. Any artifacts found would become the property of the project sponsor. All recommendations would be sent to the State Office of Historic Preservation. Construction that may be damaging to historical resources discovered would be suspended for a maximum of 4 weeks to permit inspection, recommendation and retrieval, if judged appropriate.

G. COMMUNITY SERVICES

1. Police

Internal security measures such as a security guard during regular business hours and late evenings, and 24-hour illumination of the ground floor lobby would be provided in the building to assure safety.

2. Fire

Self-contained fire and life-safety systems consisting of sprinklers, alarms and smoke removal systems would be provided as required by the San Francisco Building Code.

3. Water and Sewer

All street surfaces would be restored to their original condition after project water and sewer distribution lines are converted to existing mains. This would be done to the satisfaction to the Department of Public Works.

4. Solid Waste

A solid waste compactor would be provided for the project. A decision on the size and location of the compactor is yet to be made by architects for the project sponsor. Litter receptacles for pedestrians would be provided in sidewalk areas in locations to be determined by architects for the project sponsor.

H. ENERGY

The project sponsor would incorporate the features described in the energy impact section (page 91) in the building. These represent design factors that would conserve energy consumption. In addition, other design features could be incorporated into the structure that would further reduce energy consumption. Examples that are under consideration include:

- Dual-level lighting controls to permit lighting levels to be reduced by 50% during periods when higher illumination levels are not required.
- Provision of optimum thickness of insulation for duct-work, piping and equipment.
- Devices in washrooms to limit water outlet temperatures to 110 degrees Fahrenheit.

It is not possible at this time to quantify the actual reduction in energy consumption the above mitigation measures would achieve. The project sponsor has not determined that these features would be incorporated in the building, but would investigate the feasibility of using them in view of the requirements of Title 24. Within one year after the building would be fully occupied, the project sponsor would provide the Department of City Planning natural gas and electricity consumption figures for the building's operation. If energy consumption exceeds the requirements of Title 24, the project sponsor would have a PG&E certified audit performed and additional energy conservation measures would be implemented as recommended.

The building would be heated and cooled by mechanical equipment. Therefore, fixed (non-operable) windows are proposed for the building. The use of operable windows has been rejected by the project's architects because operable windows would increase air conditioning loads on warm days and increase heating loads on cool days, creating greater demands on energy use within the building.

I. HOUSING

The project sponsor recognizes the cumulative demand for housing in San Francisco and the Bay Area that continued high-rise office construction creates.

In order to alleviate the housing demand attributable to the project, the project sponsor would apply good faith efforts to build or cause to be built new housing units in the San Francisco Bay Area (including the possibility of San Francisco if financially feasible), and/or rehabilitate or cause to be rehabilitated existing substandard housing units in the San Francisco Bay Area (including the possibility of San Francisco if financially feasible), the total number of such new and/or rehabilitated housing units to be determined in cooperation with the San Francisco Department of City Planning.

The project sponsor does not agree to contribute to a housing development fund or similar program if required by the City, due to the uncertainty of dollar amounts required in the future or potential inequities in contributions between the various project sponsors.

In cooperation with the Department of City Planning or other appropriate agency of City government, the project sponsor could participate in coordinating formation of a panel of lenders, developers, architects, builders and representatives of relevant interest groups and agencies to explore and develop approaches to the alleviation of local and regional housing shortages. The efforts of the panel could be directed toward preparation of a study addressing contemporary and foreseeable housing issues and their resolution. Particular attention could be directed toward the appropriate role, if any, of Downtown property owners, tenants and developers in alleviating identified shortages. The study could be prepared, published and presented in an appropriate public forum and in a timely manner.

V. UNAVOIDABLE ADVERSE IMPACTS

1. Transportation

Cumulatively, if auto commuting increases at the same rate as transit travel, the total peak hour auto travel in the downtown area could increase by approximately 30% in 1983 without the proposed project. The proposed project would represent approximately 4% of this increase. In addition to a degradation in the quality of traffic flow on surface streets, the freeways and freeway ramps will be critical links in the overall roadway network. With these facilities currently operating under congested conditions during peak hours, the traffic increases generated by cumulative downtown development will add to this congestion with the likely result that travel delays will be extended.

With a design capacity of 8,085 peak-hour passengers, the effect of cumulative downtown development on Golden Gate Transit District would be to raise patronage beyond this figure. Because of financial limitations the District will likely not be able to markedly increase its capacity.

The project would generate demand for approximately 340 long-term parking spaces and 145 short-term parking spaces. The majority of the demand would need to be accommodated at other locations in the area where current parking occupancy rates are about 85%-95%.

Downtown development projected for the next 5 years would add to the parking demand in the downtown area. Although the proposed project would account for only a small portion of this increase in parking demand, there would be cumulative demand. It is likely that parking would shift further from downtown with increased demand south of Folsom Street and beyond.

2. Noise

During the use of impact wrenches for building framing directly outside the adjacent Howard Street buildings, noise levels could reach 100 dBA outside and about 75 dBA inside. This activity would be sporadic but workers in offices nearest the noise source would not be able to use the telephone or carry on a conversation when the impact wrenches would be in use.

3. Visual Quality

At increasing heights in adjacent buildings, views outward would be blocked up to the building's 19th floor level; the degree of view blockage would vary with respect to elevation and observer location in relation to the project.

4. Historical Resources

It is not feasible to rule out the possibility of encountering historical or archaeological resources during construction of the new building.

5. Energy

Assuming a potential 50-year lifetime for the building, the estimated lifetime energy cost (including construction, operation, transportation and removal) would be about 4 trillion BTU. This is equivalent to approximately 740,000 barrels of crude oil.

6. Air Quality

During construction, airborne dust and dust fall downwind from the site would be increased. Although no measurable effect on regional photochemical oxidant concentrations owuld be anticipated due to increases in vehicular traffic from the project, photochemical oxidants are expected to be a persistent problem in the future in the Bay Area. Reductions in hydrocarbons and oxides of nitrogen emissions will be necessary to attain the federal standard for photochemical oxidant (ozone) in the region.[1]

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[1]Association of Bay Area Governments, 1979 Bay Area Air Quality Plan, January 1979.

VI. ALTERNATIVES TO THE PROPOSED PROJECT

A. NO-PROJECT ALTERNATIVE

If the proposed project were not constructed, the site would be returned to use as a parking lot for an unspecified period of time after construction completion of the adjacent 150 Spear Street office building (EE78.413). With the retention of the site in its current use, none of the identified impacts associated with the proposed project would be exerted on the downtown area.

The no-project alternative would hold open future options for the land to be developed under other development scenarios (see VI.B. below). Deferment of development could also give time for existing zoning codes to be amended affecting the ultimate build-out potential of the site.

B. ALTERNATIVE SITE USES

Under the C-3-0 zoning, other possible site uses include dwellings, hotels, business services, and sales (see Chapter I.C., Zoning, page 5).

1. Retail Sales and Hotel Use

Retail sales use of the site in a building comparable in size to the proposed project would generate trips at a higher rate on a daily and peak hour basis than office space and it would be likely that larger impacts on traffic, transit, pedestrian flow, and noise would occur for such a project. Hotel use would generate daily trips on a higher daily basis and fewer peak hour trips than the project as

proposed. However, because the site is located at the fringe of the Central Business District, for economic reasons it is unlikely that the site would be intensively developed for retail sales or hotel use purposes.

2. Wholesaling Use

A wholesaling operation would be a less intensive use of the site than the proposed project, and it would have less impact on automobile traffic, transit and pedestrians. Truck traffic, however, would increase. Tax revenues would likely be less than for the proposed project, as would employment and less municipal expenditures would be required while cumulative, indirect housing impacts would be reduced. Some blue-collar employment would directly be created by wholesaling use of the site. The project sponsor believes that the land is too expensive to permit wholesaling use on the project site, that wholesaling would not generate enough revenues to offset the cost of the land.

3. Housing/Commercial/Office Use

Under existing C-3-0 zoning, the maximum number of residential units permitted on the site would be about 202.[1] The number of dwelling units to be filled in San Francisco by employees who would work in the building as proposed is computed to be 259 (see Section III.K., Growth Inducements, on page 102). However, as a mixed housing/commercial/and office use project, the gross square footage of the structure could not be greater than the project as proposed due to the 240-foot height limit. Therefore, assuming a mixed use building of equal size to the project as proposed, the 15,500 gross square feet of ground floor and commercial space (net commercial space would be 7,460 square feet), would allow for 290,950 gross square feet of office and housing space. Allowing for 140,000 gross square feet of office

[1]City and County of San Francisco, Planning Code, Section 215. Calculated at a site area of 25,208 S.F. ÷ 125 S.F./dwelling unit = 202 units.

space would generate a demand for 124 dwelling units which could be acommodated on the site at 1,217 gross square feet average each. Such a mixed use project would be compatible with potential future residential uses adjacent to the Rincon Annex post office planned by the Redevelopment Agency at the northeast corner of the intesection of Howard and Spear Streets. Development of the project site for residential use only would yield 202 units at an average size of 1,517 gross square feet each.[1]

Trip generation due to residential use of the site would likely be lower than the project as proposed because fewer individuals would enter and leave the site on a daily basis. This would vary, depending on the size of the residential development and number of dwelling units constructed. Peak-hour trips would be outbound in the morning and inbound in the evening, in reverse to those for the proposed project and for the Central Business District in general. Traffic impacts would be expected to be less, while pedestrian and transit impacts would be either greater or less, depending on where the majority of residents would travel to work. Parking demands for residential use would, again, vary depending upon the size of the project. Parking demands could increase in other areas containing food stores and convenience shopping facilities if a residential structure were constructed on the project site, given the current absence of residential neighborhood amenities such as food stores, entertainment facilities, shops and restaurants.

Revenues generated to the City from residential use of the site could be less than those accruing from office use as no payroll tax would be levied (except for personnel providing services to the residential units). Property tax may be higher than for the proposed project depending on the size of the residential development and the relative rates of ownership turnover. Utility users

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[1]Residential use of the building would not yield an exterior building appearance significantly different from that which is currently proposed (see Figures 4 and 7, pages 7 and 10, and Figures 26, 27 and 28, pages 124, 125 and 126.

tax would also be greater than for the proposed project due to the increased consumption of water, gas and electricity (telephone use may be more for an office building). Demands on municipal services would be greater than for the proposed project, particularly recreational and police protection. Indirect revenues related to residents spending money for goods and services (sales tax) and non-local subventions on a per capita basis would be greater for residential use than for the proposed project.

The project sponsor notes that 1:1 parking for the residential portion of a housing/commercial/office project would be required to secure construction and residential financing, which in turn would require 4 floors of underground parking at the ratio of about 30 parking spaces per floor.[1] The project sponsor feels that the cost of constructing such underground parking would cause the cost of housing to rise beyond the ability of prospective buyers to purchase the residential units. Presence of groundwater in the area at 8 to 10 feet below the ground surface indicates that the project site would probably require dewatering if 4 levels of underground parking were to be provided.

If one parking space were provided for every 4 dwelling units, one basement level would be required. At a construction cost of about $75 per square foot of space, the basement level would require about $1,200,000 or $9,700 per unit. One basement parking space for each unit would cost about $38,800.

The project sponsor notes that an additional bank of elevators would be required to serve the housing, creating a total of 2 elevator banks (1 for office use and 1 for the housing), reducing interior square footages and increasing housing and office leasing costs, ultimately reducing sales and leasing potential.

Possible residential use of the site is not being considered by the project sponsor because of the above cost factors and

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[1]Current zoning in the C-3 districts requires one off-street parking space for every 4 dwelling units.

also due to the uncertainty of marketing residential units in a business district where there are currently no nearby dwellings or neighborhood amenities such as food stores, entertainment facilities, and restaurants available for evening meals. Developing the site for residential purposes would help to ameliorate the housing demand in San Francisco (the extent would depend on the type of housing available, i.e., whether it would be intended for low and moderate income people, a mix, or luxury apartment condominiums).

4. Parking Garage

The site could be developed as a commercial parking garage, subject to approval by the City Planning Commission as a conditional use. The Transportation Element of the San Francisco Comprehensive Plan shows the project site to be in a parking belt, defined as:

> "areas appropriate for short-term parking facilities to replace spaces removed from the core area; located and designed to intercept vehicles entering downtown from major thoroughfares before they reach the downtown core automobile control area."[1]

If the site were developed as a commercial parking garage, total employee trip generation would be less than the project as proposed and impacts on transit would be less. However, the number of vehicular trips ending and originating at the site would be greater, in turn increasing impacts on traffic conditions, the noise environment and air quality in the immediately adjacent area.

The project sponsor notes that land costs are too high to construct a structure for the sole purpose of parking vehicles on the project site.

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[1]City and County of San Francisco, Department of City Planning, The Comprehensive Plan, Transportation, adopted by Resolution 6834 of the San Francisco City Planning Commission, 27 April 1982; pages 24-25.

C. DEVELOPMENT WITHOUT INTERIM BONUS CONTROLS

Interim bonus controls impose limitations upon the award of bonus provisions which provide for an increase in floor area ratios (FAR) within C-3 districts for all projects except those "grandfathered" by action of the Board of Supervisors (see Section I.C. Zoning, page 5). The City Planning Commission recently initiated changes in the text of the Interim Bonus Control Ordinance, which expired on 1 July 1981. One amendment to the text temporarily extends the controls while a second amendment proposes extending the controls for a longer period of time to 1 July 1983, pending completion of a Downtown EIR.[1]

In the absence of any specific proposed revisions to the Planning Code at this time, this alternative examines development on the project site assuming there were no interim bonus controls, and the bonuses allowed in the Planning Code, Section 126, were available; (the project as proposed claims no bonuses).

Although the project's proposed FAR is 12.2:1, the basic FAR for the site is 14:1, allowing development of 352,912 gross square feet. The project design incorporates 2 features that appear to be eligible for bonus award: multiple building entrances and sidewalk widening. Under bonus provisions, an allocation of 10,000 square feet and about 32,000 square feet, for a total area of approximately 395,000 gross square feet, would be permitted, or about 88,500 gross square feet above the 306,450 gross square feet proposed. Height provisions of the Planning Code confine the office building envelope to the height proposed for the project. The additional area could then

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[1] A number of alternative planning criteria to limit downtown development have been proposed. Their impacts will be evaluated in terms of the environmental review process. After the Downtown EIR has been completed it is anticipated that specific revisions to the Planning Code will be proposed.

be incorporated by adding additional floors to proposed open space or seeking conditional use permit approval for specific exemption from the bulk limits.[1]

If a larger building were constructed on the site, the impacts identified for the proposed project would be proportionately more, particularly in the areas of traffic, transit, pedestrian flow and energy consumption.

D. ALTERNATIVE DESIGNS

Alternative building designs prepared by the project architects included schematic design schemes generally addressing details in the exterior shape of the building, window placement, exterior building materials and the location of pedestrian access points (see Figures 26, 27 and 28, pages 124, 125 and 126). In the opinion of the project architects and sponsor, the selected design proposed represents a combination of the above features that are most aesthetically appropriate and the arrangement of internal building spaces and use functions of greatest efficiency. The alternative of providing a pavilion containing retail space and a roof garden extending from the building's east face toward Spear Street was previously considered by the project sponsor, but was rejected due to the uncertainty of retail sales of a magnitude greater than currently proposed being successful over the long term. Previously, rounded building corners were proposed. The rounded building corners were rejected to establish architectural harmony between the proposed building and adjacent structures. In addition, the building's roofline steps down toward the building corners to provide greater definition of the roofline. The stepped down

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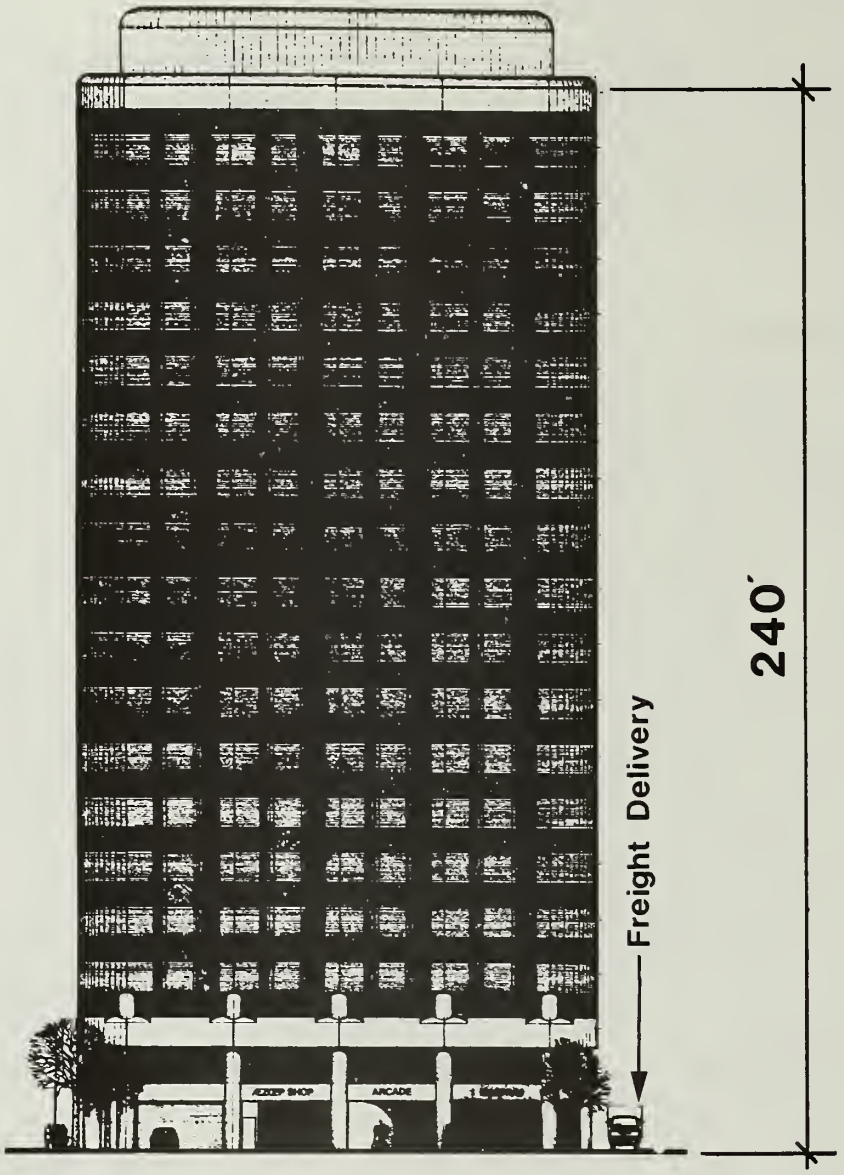
[1]Section 271 of the Planning Code provides that special exception to bulk limits may be awarded where certain criteria are met. Such criteria are related to appearance, design, choice of materials, compatibility with the surrounding area, silhouette, and preservation or enhancement of the pedestrian environment.

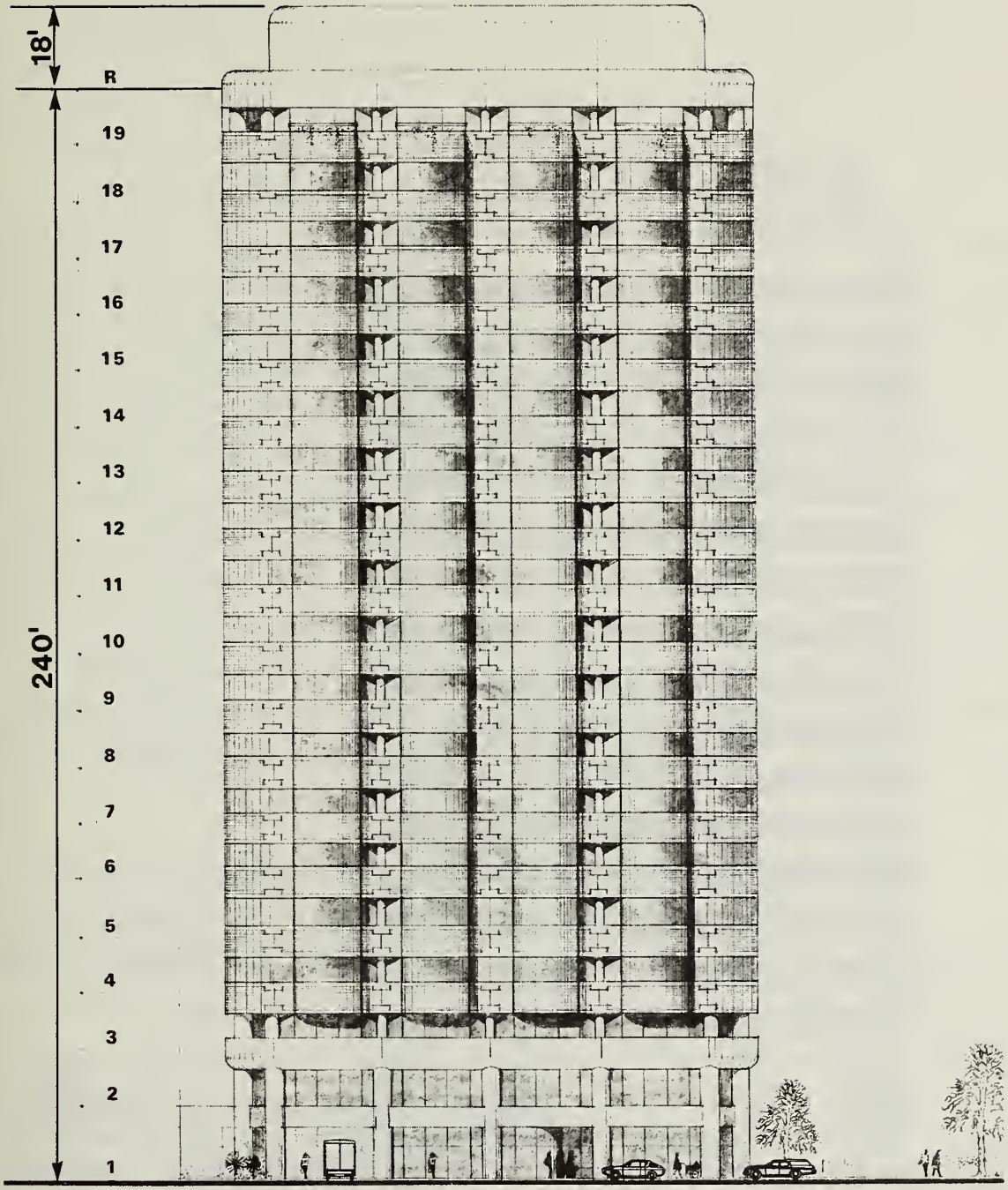


Alternative Design A- West Elevation

Source: Jorge De Quesada, Inc., Architects

0 10 20 40
Scale Feet

Figure No. 26

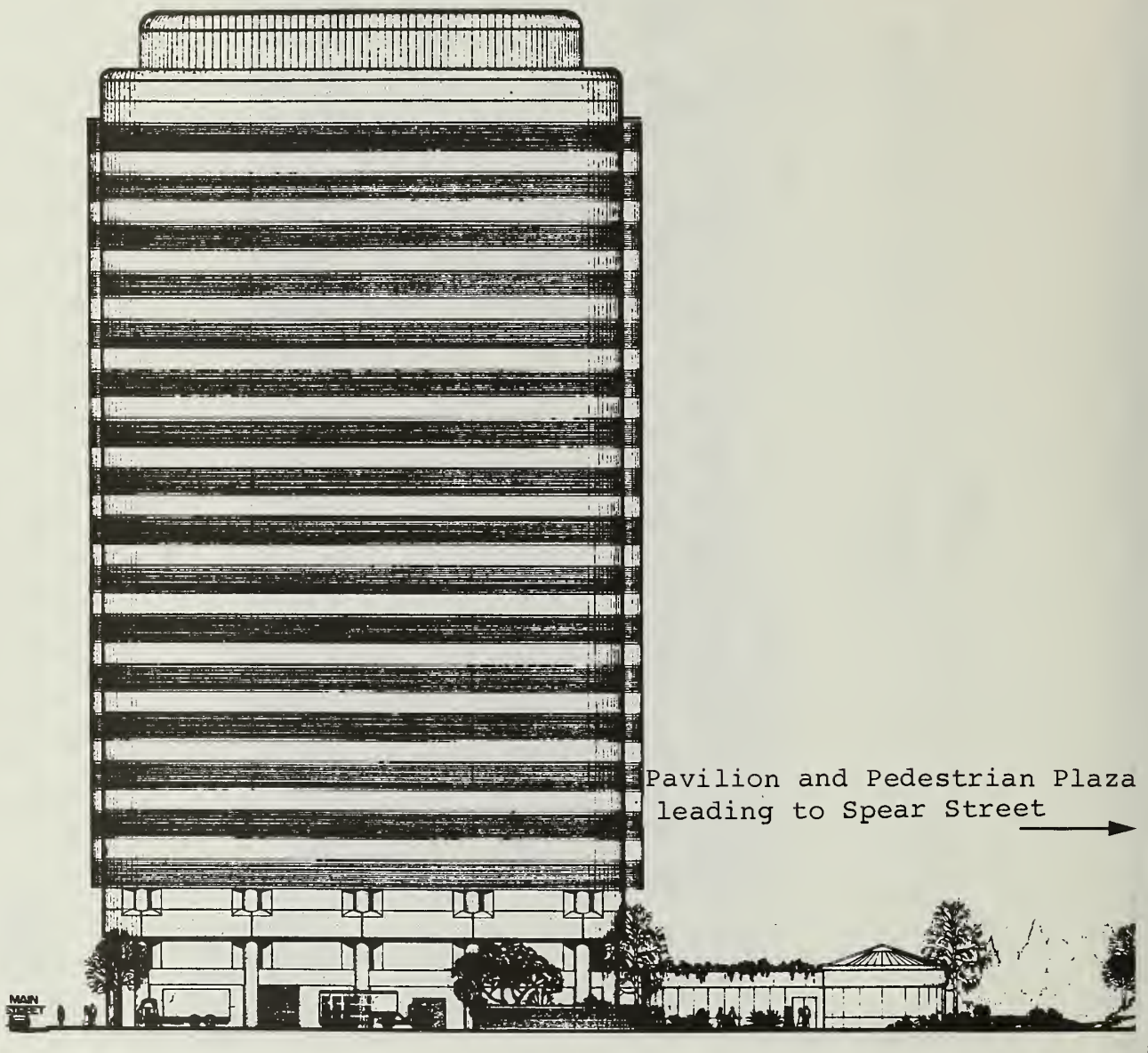


Alternative Design B
West Elevation

0 20 40 80
Scale Feet

Source: Jorge De Quesada, Inc., Architects

Figure No. 27



Alternative Design C- South Elevation

Source: Jorge De Quesada, Inc., Architects

0 10 20 40
Scale Feet

Figure No. 28

roofline is reflected in the configuration of the spandrels at the building corners (Figure 4, page 7), and was not a consideration in early design work on the building.

The proposed 115 Main Street building would join the Main and Spear building at the north property line at the ground floor. The 2 structures would be separated by 22½ feet of space at all floors above the ground floor. The alternative of spacing the buildings 15 feet apart above the ground floor would permit less daylight between the structures because of increased shadowing. Reducing the spacing of the structures to 5 feet would allow greater visual contact between occupants of the 2 buildings, increase windspeeds between the structures and provide increased shadowing than the project as proposed. Pedestrian comfort due to wind at the ground level would not be affected by more closely spaced building alternatives because the structures would be joined at the ground level as noted. A noticeable change in energy consumption would not be expected to occur under alternative building spacings.

E. GUIDING DOWNTOWN DEVELOPMENT ALTERNATIVE

Guiding Downtown Development[1] (GDD) is a report recently prepared by the Department of City Planning containing a series of regulatory proposals for managing development in downtown San Francisco. The proposals affect the size, design, and location of major buildings. They also deal with the effect new development has on housing, transportation, and open space, on architecturally significant older buildings, and on the general environment and livability of the central business district.

The proposals will undergo an extended period of public review and comment as well as environmental impact assessment. The proposals will then be modified as appears appropriate in

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[1]City and County of San Francisco, Department of City Planning, Guiding Downtown Development, May 1981. The document is commonly referred to as "Approaches III."

light of that review and assessment. Formal public hearings on proposed Master Plan and Planning Code changes before the City Planning Commission are anticipated in late spring of 1982.

On 4 June 1981, the City Planning Commission adopted Resolution 8982 which requires that any project for which a Draft EIR had not been advertised prior to 4 June 1981 include an alternative for environmental evaluation a building proposal that would comply with the proposed controls contained in Guiding Downtown Development (GDD). Accordingly, a comparison is made on the following pages between the project as proposed and the controls that would pertain to the project with the resulting GDD-induced change identified.

G.D.D. PROPOSALS	SPEAR AND MAIN ST. PROJECT PROPOSALS	G.D.D. INDUCED CHANGE
A. Building Size, Design and Appearance	A.	A.
(1) Maximum Floor Area Ratio (FAR) for C-3-0 District with housing, development rights transfer, restoration and retail space not to exceed 17:1. Maximum base FAR to be 12:1.	(1) 306,500 gross sq. ft. ÷ Site Area of 25,208 sq. ft. = 12.2:1 FAR (existing allowed FAR is 14:1).	(1) Project would exceed the proposed 12:1 base FAR; however, would be permitted additional .5 FAR for retail use (see item B.1 below), and would be under maximum permitted FAR of 12.5 permitted for the project.
(2) Average floor area per floor should be a maximum of 20,000 square feet.	(2) Average floor would contain 16,129 sq. ft. as proposed. No floor would exceed 20,000 sq. ft.	(2) ---
(3) 1/15 of total floor area above building midpoint above 65 feet to be transferred to lower floors.	(3) Building would be rectangular in plan dimension and would not step inward at upper floors.	(3) 13th through 19th floors reduced by 22,544 sq. ft. Lower coverage at upper floors, reduced building bulk at upper floors.
(4) Maximum average diagonal plan dimension not to exceed 200 feet. Increase in lower floors permitted with decrease in upper floors.	(4) Maximum plan dimension is 168 feet as proposed.	(4) ---
(5) Building height not to exceed 240 feet.	(5) 240 feet building height.	(5) ---
(6) Strengthen Urban Design Standards	(6)	(6)
a. Create interesting street frontages.	a. Base of building visually differentiated from upper floors.	a. ---
b. Conserve traditional street and building relationships.	b. Building would assist in visually defining the alignment of Main Street. Open circulation space would be provided between buildings consistent with existing walkways on the block.	b. ---

G.D.D. PROPOSALS	SPEAR AND MAIN ST. PROJECT PROPOSALS	G.D.D. INDUCED CHANGE
c. New facades to relate to nearby facades.	c. To be determined; other building proposals being prepared.	c. ---
d. Preserve scale, form and building proportions in new construction.	d. Building would relate to the scale and form of existing and proposed highrises in the project area. Building would not relate to lower 2-story structures on the block which are to be removed for new construction.	d. ---
(7) Incorporate art work in new buildings.	(7) No art work proposed.	(7) Would require addition of art work to provide additional visual interest to pedestrians and building occupants.
(8) Provide for the installation of street trees.	(8) Street trees would be provided.	(8) ---
B. Retail Space	B.	B.
(1) Floor area allowance for ground retail uses (maximum 2,000 sq. ft. per establishment).	(1) 7,460 gross sq.ft. of retail space is proposed.	(1) Add 0.5 FAR per G.D.D. Each retail establishment would be up to a maximum at 2,000 gross square feet.
(2) Provide adequate convenience shopping and facilities.	(2) 7,460 gross sq. ft. of retail space is proposed.	(2) ---
(3) Ground floor space on street frontage and pedestrian ways devoted to retail uses.	(3) The noted features are proposed as stated.	(3) ---
(4) Retail space to be limited so as not to compete with the downtown core.	(4) Retail space would serve occupants of the proposed building and adjacent structures.	(4) ---
C. Recreation and Open Space	C.	C.
Provide recreation and open space in C-3-0 District at ratio of 1 sq. ft. for each 25 gross sq. ft. of building floor area.	Open space and pedestrian ways proposed = 11,150 sq. ft.	306,500 gross sq. ft. ÷ 25 = 12,260 sq. ft. of recreation and open space required; (increase of 1,110 sq. ft. open space would be required by G.D.D.).

G.D.D. PROPOSALS	SPEAR AND MAIN ST. PROJECT PROPOSALS	G.D.D. INDUCED CHANGE
D. Transportation and Circulation	D.	D.
(1) Contribute funds for maintaining and augmenting transportation service (Transit Fee and Assessment District).	(1) Committed to by project sponsor.	(1) ---
(2) Employ a transportation broker responsible for encouraging transit use and ride sharing.	(2) Sponsor would encourage transit use and ride sharing.	(2) Employ transportation broker.
(3) Provide a "reasonable number" of bicycle and moped parking spaces.	(3) Bike parking to be provided at ground level external to the building, amount to be determined.	(3) ---
(4) Participate with other developers in studies of providing "intercept" commuter parking facilities and shuttle service to project.	(4) Committed to by project sponsor.	(4) ---
(5) New long-term parking to be located on periphery of downtown; new short-term to be adjacent to core area; no parking in core area without conditional use.	(5) 35 tenant parking spaces to be provided.	(5) Would require conditonal use authorization.
(6) Provide off-street loading at 0.1 space per 10,000 sq. ft. of building area.	(6) Two large truck and 3 delivery van spaces would be provided.	(6) ---
(7) Minimum loading space length to be one at 55 feet, others at 35 feet; maximum curb cut to be 24 feet.	(7) Loading spaces would accommodate 55 ft. truck and 35 ft. truck. Proposed curb cut for truck is 20 feet.	(7) ---
(8) Access to off-street parking or loading should be from minor and non-pedestrian streets in preference to transit preferential streets.	(8) Main Street is not a transit preferential street.	(8) ---
(9) New development to be required to accommodate midblock pedestrian walkways according to a network plan.	(9) Project would provide and accommodate pedestrian walkways.	(9) ---

G.D.D. PROPOSALS	SPEAR AND MAIN ST. PROJECT PROPOSALS	G.D.D. INDUCED CHANGE
E. Housing Housing should be provided either on the project site or elsewhere in the City at a rate of 640 sq.ft. for every 1,000 sq.ft. of office space.	E. Housing is not a part of base proposal.	E. Additional housing on or off-site would be required.
F. Building Preservation Avoid destruction of historical buildings.	F. Site is vacant.	F. ---
G. Cumulative Impact Assessment Sponsors to contribute funds to keep cumulative environmental impact data current over time.	G. To be determined.	G. ---

VII. EIR AUTHORS AND PERSONS CONSULTED

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Larry Stueck, Senior Transportation Planner

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Sacramento, California 95814
Attention: William Lockett

State Office of Intergovernmental Management (10)
State Clearinghouse
1400 - Tenth Street
Sacramento, California 95814

U.S. Environmental Protection Agency, Region IX
215 Fremont Street
San Francisco, California 94105

REGIONAL AGENCIES

Association of Bay Area Governments
Hotel Claremont
Berkeley, California 94705

Bay Area Air Quality Maintenance District
939 Ellis Street
San Francisco, California 94109
Attention: Ralph Meade

Bay Area Rapid Transit District
800 Madison Street
Oakland, California 94607

Golden Gate Bridge Highway & Transportation District
P.O. Box 9000, Presidio Sta.
San Francisco, California

Alameda-Contra Costa Transit District
508 - 16th Street
Oakland, CA 94612

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Metropolitan Transportation Commission
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Berkeley, California 94705

San Mateo County Transit District
400 South El Camino
San Mateo, California 94402

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Jerome Klein
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Lee Woods, Secretary

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Distribution Division
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San Francisco Department of Public Works
Traffic Engineering Division
460 McAllister Street
San Francisco, California 94102
Attention: Scott Shoaf

San Francisco Fire Department
260 Golden Gate Avenue
San Francisco, California 94102
Attention: Joseph Sullivan, Chief
Division of Planning and Research

San Francisco Police Department
850 Bryant Street
San Francisco, California 94103
Attention: Cornelius Murphy
Chief

San Francisco Bureau of Engineering
Mechanical Section
45 Hyde Street, #222
San Francisco, California 94102
Attention: Mr. Danehy

MEDIA

KBHK - Channel 44
420 Taylor Street
San Francisco, California 94108
Attention: Juana Samayoa

KCBS, News Radio
One Embarcadero Center
San Francisco, California 94115

KGO, Channel 7 (News)
277 Golden Gate Avenue
San Francisco, California 94102
Attention: Joyce Shank

KPIX, Channel 5 (News)
2655 Van Ness Avenue
San Francisco, California 94123

KRON, Channel 4 (News)
1001 Van Ness Avenue
San Francisco, California 94109

KQED Television Studio
500 - Eighth Street
San Francisco, California 94103

San Francisco Bay Guardian
27000 - Nineteenth Street
San Francisco, California 94110
Attention: Patrick Douglas
City Editor

San Francisco Chronicle (2)
925 Mission Street
San Francisco, California 94103
Attention: Marshall Kilduff

San Francisco Examiner (2)
110 - Fifth Street
San Francisco, California 94103
Attention: Gerald Adams

San Francisco Progress
851 Howard Street
San Francisco, California 94103
Attention : Mike Newberry

The Sun Reporter
1366 Turk Street
San Francisco, California 94115

LIBRARIES

Documents Department
City Library - Civic Center
San Francisco, California 94102
Attention: Faith Van Liere

LIBRARIES

Environmental Protection
Agency Library
215 Fremont Street
San Francisco, California 94105
Attention: Jean Circiello

Government Documents Section
Stanford University
Stanford, California 94305

Government Publications Department
San Francisco State University
1630 Holloway Avenue
San Francisco, California 94132

Hastings College of the Law - Library
198 McAllister Street
San Francisco, California 94102

GROUPS AND INDIVIDUALS

AIA
Northern California Chapter
790 Market Street
San Francisco, California 94102

Bechtel Building
45 Fremont Street
San Francisco, California 94105

Berliner, Edwin E. and Helen
120 Howard Street
San Francisco California 94105

Building Owners and Managers
Association
690 Market Street
San Francisco, California 94104

Building Service Employees Union
Local 87
240 Golden Gate Avenue
San Francisco, California 94102

Charles Hall Page and Associates
364 Bush Street
San Francisco, California 94104

Jorge De Quesada, Inc.
1700 Montgomery Street
San Francisco, California 94111
Attention: Cathal O'Doherty
Project Director

Downtown Association
582 Market Street
San Francisco, California 94104
Attention: Lloyd Pflueger, Mgr.

Downtown Senior Social Services
295 Eddy Street
San Francisco, California 94102

The Foundation for San Francisco's
Architectural Heritage
2007 Franklin Street
San Francisco, California 94109
Attention: Linda Jo Fitz
Acting Executive
Director

Freemon, Harold and Richard
140 V. Spear Street
San Francisco, California 94105

Freemon, Harold and Richard
152V Spear Street
San Francisco, California 94105

Friends of the Earth
124 Spear Street
San Francisco, California 94105
Attention: Connie Parrish

Gray Panthers
944 Market Street
San Francisco, California 94102
Attnetion: W. Nunnally

Sue Hestor
4536 - 20th Street
San Francisco, California 94114

Johnson Printing Plates Co.
135 Main Street
San Francisco, California 94105

GROUPS AND INDIVIDUALS

Junior Chamber of Commerce
251 Kearny Street
San Francisco, California 94108

League of Women Voters
12 Geary Street, Room 605
San Francisco, California 94108

Legal Assistance to the Elderly
944 Market Street, #803
San Francisco, California 94102

San Franciscans for Reasonable Growth
9 First Street
San Francisco, California 94105
Attention: Carl Imparato

San Francisco Beautiful
41 Sutter Street
San Francisco, California 94104
Attention: H. Klussman, President

San Francisco Building and Construction Trades Council
400 Alabama Street, Room 100
San Francisco, California 94110
Attention: Stanley Smith

San Francisco Chamber of Commerce
465 California Street
San Francisco, California 94102
Attnetion: Richard Morton

San Francisco Convention and Visitors Bureau
1390 Market Street, Suite260
San Francisco, California 94102
Attention: George D. Kirkland
Executive Director
D. Hess, General Mgr.

Main Street Investment Co.
180 Howard Street
San Francisco, California 94105

San Francisco Ecology Center
13 Columbus Avenue
San Francisco, California 94111

San Francisco Labor Council
3058 - 16th Street
San Francisco, California 94103
Attention: Bernard Speckman

San Francisco Planning and Urban Research Association
312 Sutter Street
San Francisco, California 94108

San Francisco Tomorrow
9 First Street
San Francisco, California 94105
Attention: Susan Smith

Senior Escort Program
South of Market Branch
814 Mission Street
San Francisco, California 94103
Attention: Leslie Halford
Neighborhood Coordinator

Eric Schou
Schou-Gallis
101 Mission Street
San Francisco, California 94105

Pacifc Telephone and Telegraph Company
140 New Montgomery Street
San Francisco, California 94105
Attention: R.J. Teglia, District Manager, Engineering

Women's Chamber of Commerce
1963 - 22nd Street
San Francisco, California 94112

CHAPTER IX

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APPENDIX A

INTERSECTION CAPACITY ANALYSIS AND LEVEL OF SERVICE DEFINITIONS

Source: Service Level Calculations performed by George W. Nickelson

INTERSECTION CAPACITY ANALYSIS

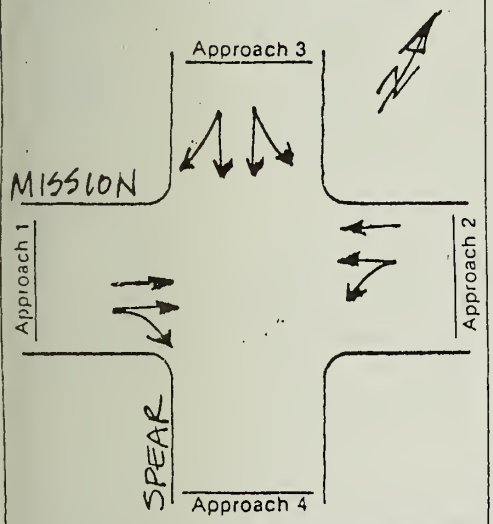
4:30-5:30pm

Intersection MISSION / SPEAR Design Hour P.M. PEAK

Other Conditions EXISTING TRAFFIC

(COUNT CONDUCTED ON 16 JULY 1980)

1. Identify Lane Geometry



4. Left Turn Check

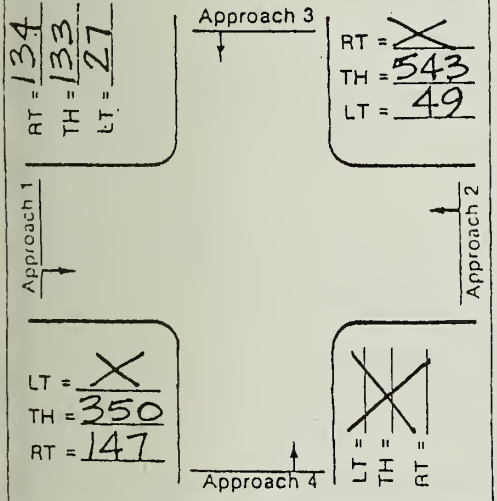
	Approach 1	2	3	4
a. Number of change intervals per hour				
b. Left turn capacity on change interval, in vph				
c. G/C Ratio				
d. Opposing volume in vph				
e. Left turn capacity on green, in vph				
f. Left turn capacity in vph (b + e)				
g. Left turn volume in vph				
h. Is volume > capacity (g > f)?				

6b. Volume Adjustment for Multiphase Signal Overlap

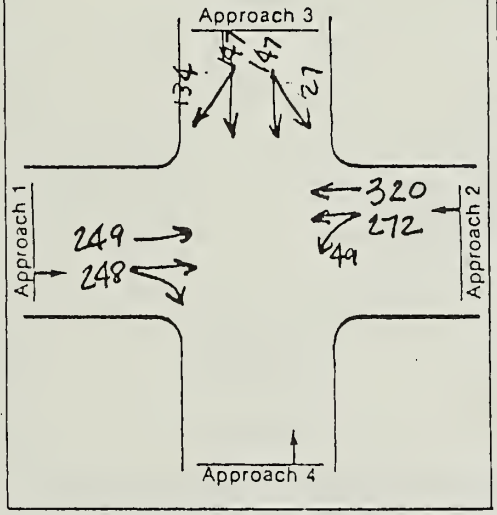
Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph

2 ϕ

2. Identify Volumes, in vph



5. Assign Lane Volumes, in vph



7. Sum of Critical Volumes

147 + 320 + — + —

= 467 vph

8. Intersection Level of Service

A

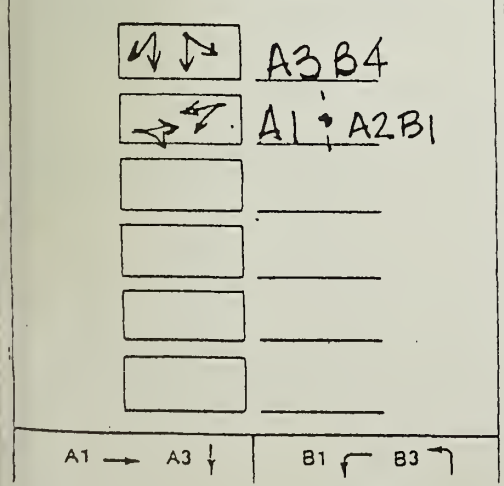
9. Recalculate

Geometric Change _____

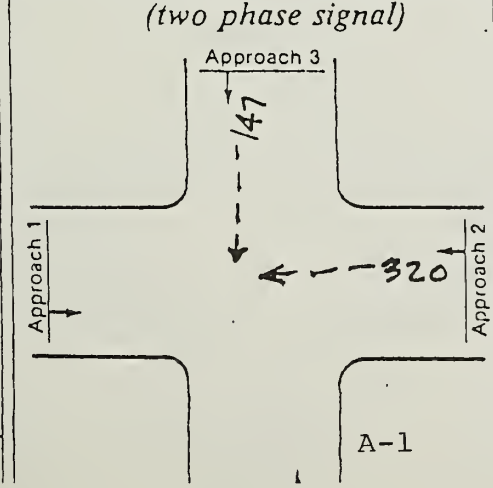
Signal Change _____

Volume Change _____

3. Identify Phasing



6a. Critical Volumes, in vph (two phase signal)



Service Level Ranges

Level	Sum of Critical Volumes 2 Phase	3 Phase	4+ Phases
A	900	855	825
B	1050	1000	965
C	1200	1140	1100
D	1350	1275	1225
E	1500	1425	1375
F	not applicable		

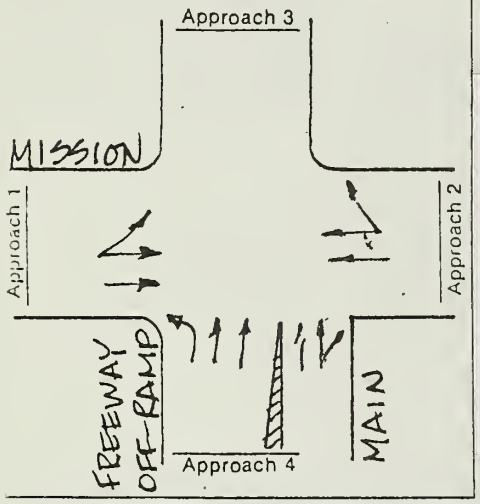
INTERSECTION CAPACITY ANALYSIS

7:30-8:30 AM

Intersection MISSION / MAIN Design Hour A.M. PEAK

Other Conditions EXISTING TRAFFIC
(COUNT CONDUCTED ON 30 APRIL 1981)

1. Identify Lane Geometry



4. Left Turn Check

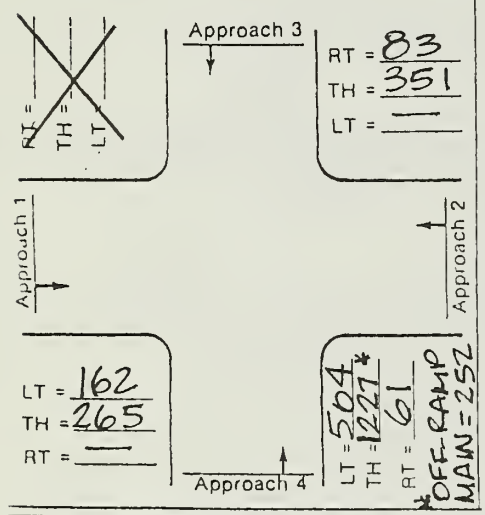
	Approach 1	2	3	4
a. Number of change intervals per hour				
b. Left turn capacity on change interval, in vph				
c. G/C Ratio				
d. Opposing volume in vph				
e. Left turn capacity on green, in vph				
f. Left turn capacity in vph (b + e)				
g. Left turn volume in vph				
h. Is volume > capacity (g > f)?				

6b. Volume Adjustment for Multiphase Signal Overlap

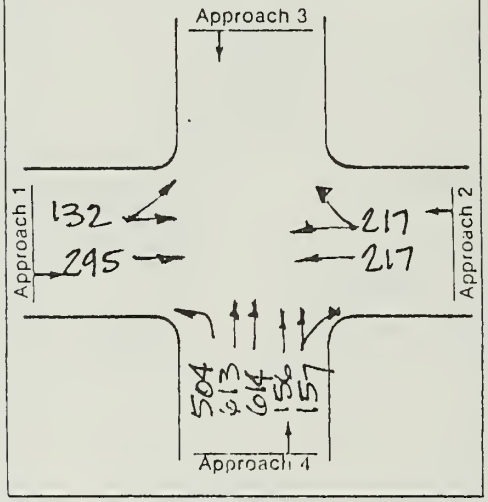
Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph

2 ϕ

2. Identify Volumes, in vph



5. Assign Lane Volumes, in vph



7. Sum of Critical Volumes

614 + 217 + 162 + — = 993 vph

8. Intersection Level of Service

B

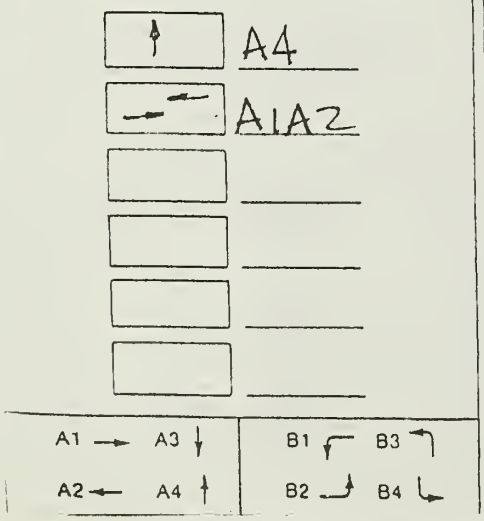
9. Recalculate

Geometric Change _____

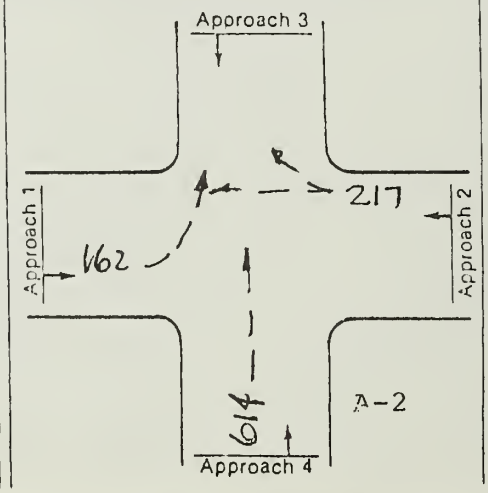
Signal Change _____

Volume Change _____

3. Identify Phasing



6a. Critical Volumes, in vph (two phase signal)



Service Level Ranges

Level	Sum of Critical Volumes 2 Phase	3 Phase	4+ Phases
A	900	855	825
B	1050	1000	965
C	1200	1140	1100
D	1350	1275	1225
E	1500	1425	1375
F	not applicable		

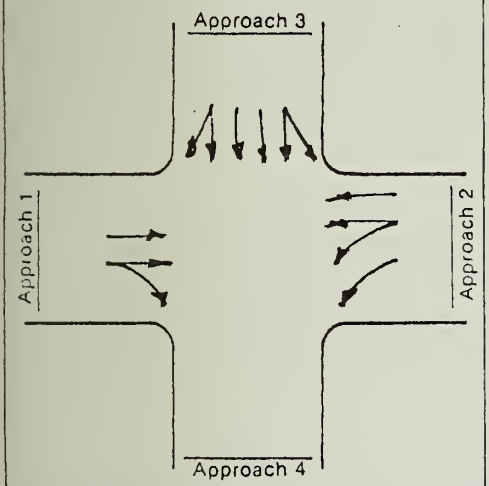
INTERSECTION CAPACITY ANALYSIS

4:30-5:30pm

Intersection MISSION / BEALE Design Hour P.M. PEAK

Other Conditions EXISTING TRAFFIC
(COUNT CONDUCTED ON 2 FEBRUARY 1981)

1. Identify Lane Geometry



4. Left Turn Check

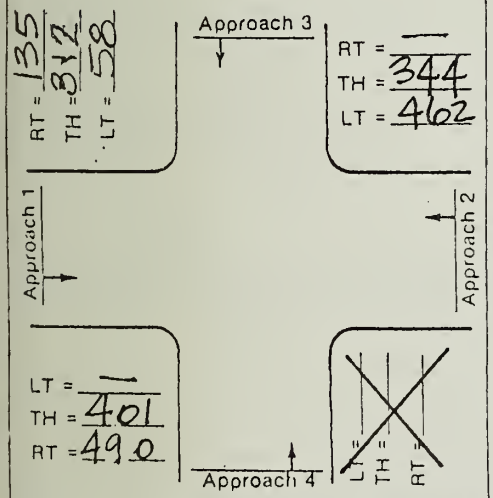
	Approach 1	2	3	4
a. Number of change intervals per hour				
b. Left turn capacity on change interval, in vph				
c. G/C Ratio				
d. Opposing volume in vph				
e. Left turn capacity on green, in vph				
f. Left turn capacity in vph (b + e)				
g. Left turn volume in vph				
h. Is volume > capacity (g > f)?				

6b. Volume Adjustment for Multiphase Signal Overlap

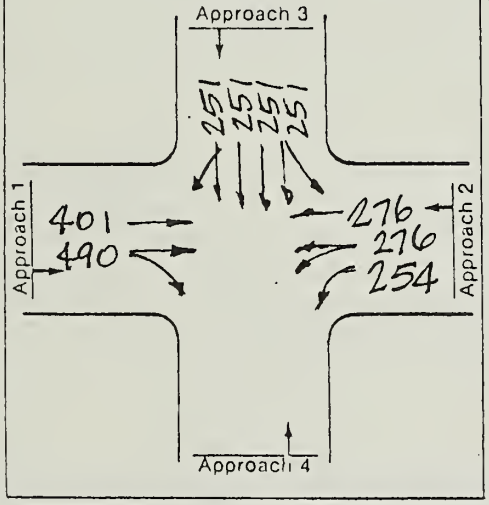
Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph

3Ø

2. Identify Volumes, in vph



5. Assign Lane Volumes, in vph



7. Sum of Critical Volumes

490 + 251 + 276 + —

= 1017 vph

8. Intersection Level of Service

C

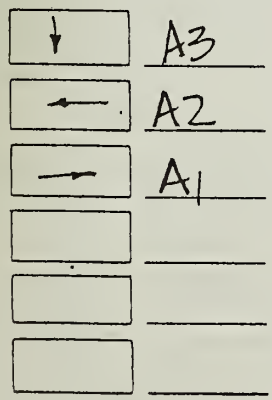
9. Recalculate

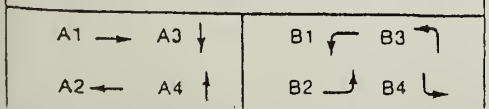
Geometric Change _____

Signal Change _____

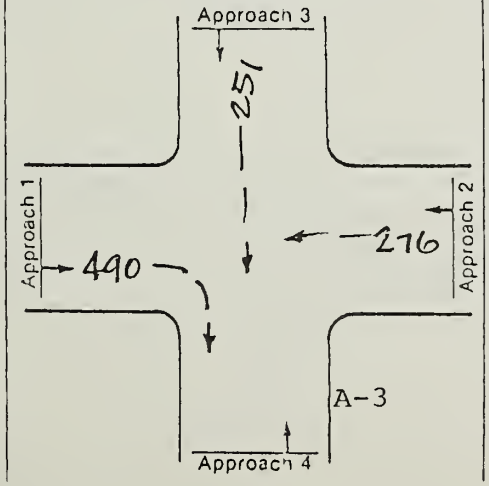
Volume Change _____

3. Identify Phasing





6a. Critical Volumes, in vph (two phase signal)



Service Level Ranges

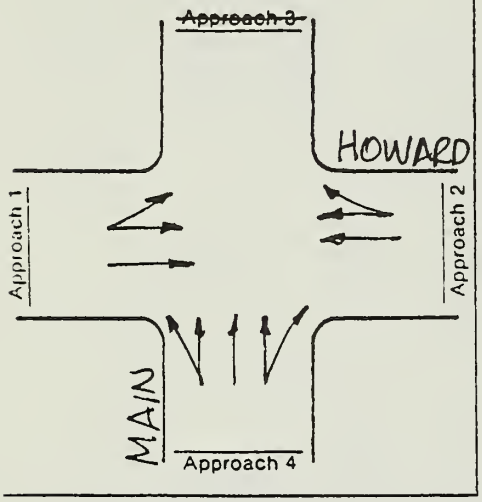
Level	Sum of Critical Volumes 2 Phase	3 Phase	4+ Phases
A	900	855	825
B	1050	1000	965
C	1200	1140	1100
D	1350	1275	1225
E	1500	1425	1375
F	not applicable		

INTERSECTION CAPACITY ANALYSIS

Intersection HOWARD / MAIN Design Hour P.M. PEAK 4:30-5:30 pm.

Other Conditions EXISTING TRAFFIC VOLUMES
(COUNT CONDUCTED ON 30 OCTOBER 1980)

1. Identify Lane Geometry



4. Left Turn Check

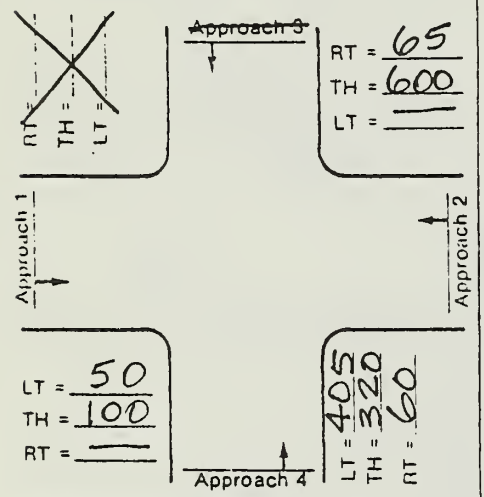
	Approach 1	2	3	4
a. Number of change intervals per hour				
b. Left turn capacity on change interval, in vph				
c. G/C Ratio				
d. Opposing volume in vph				
e. Left turn capacity on green, in vph				
f. Left turn capacity in vph (b + e)				
g. Left turn volume in vph				
h. Is volume > capacity (g > f)?				

6b. Volume Adjustment for Multiphase Signal Overlap

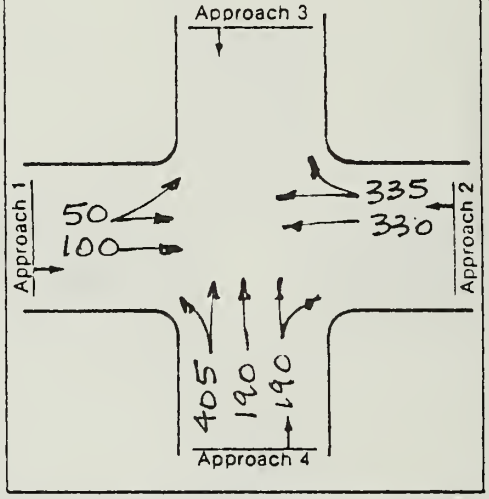
Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph

2 Ø

2. Identify Volumes, in vph



5. Assign Lane Volumes, in vph



7. Sum of Critical Volumes

50 + 335 + 405 + — =

= 790 vph

8. Intersection Level of Service

A

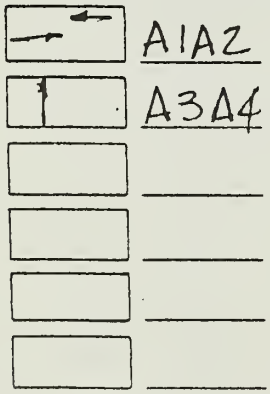
9. Recalculate

Geometric Change _____

Signal Change _____

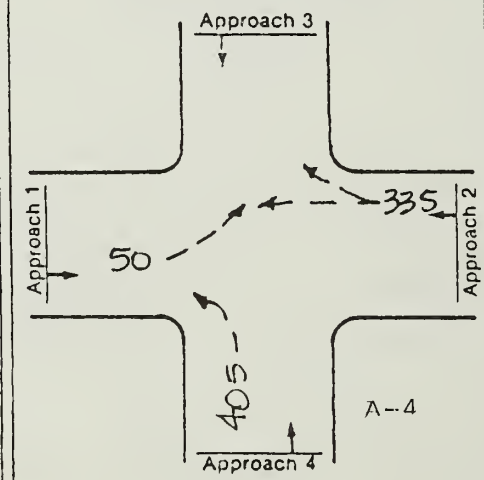
Volume Change _____

3. Identify Phasing



A1 → A3 ↓	B1 ↱ B3 ↰
A2 ← A4 ↑	B2 ↳ B4 ↲

6a. Critical Volumes, in vph (two phase signal)



A-4

Service Level Ranges

Level	Sum of Critical Volumes 2 Phase	3 Phase	4+ Phases
A	900	855	825
B	1050	1000	965
C	1200	1140	1100
D	1350	1275	1225
E	1500	1425	1375
F	not applicable		

LEVELS OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS

Level of Service A

Level of Service A describes a condition where the approach to an intersection appears quite open and turning movements are made easily. Little or no delay is experienced. No vehicles wait longer than one red traffic signal indication. The traffic operation can generally be described as excellent.

Level of Service B

Level of Service B describes a condition where the approach to an intersection is occasionally fully utilized and some delays may be encountered. Many drivers begin to feel somewhat restricted within groups of vehicles. The traffic operation can generally be described as very good.

Level of Service C

Level of Service C describes a condition where the approach to an intersection is often fully utilized and back-ups may occur behind turning vehicles. Most drivers feel somewhat restricted but not objectionably so. The driver occasionally may have to wait more than one red traffic signal indication. The traffic operation can generally be described as good.

Level of Service D

Level of Service D describes a condition of increasing restriction causing substantial delays and queues of vehicles on approaches to the intersection during short times within the peak period. However, there are enough signal cycles with lower demand such that queues are periodically cleared, thus preventing excessive back-ups. The traffic operation can generally be described as fair.

Level of Service E

Capacity occurs at Level of Service E. It represents the most vehicles that any particular intersection can accommodate. At capacity there may be long queues of vehicles waiting upstream of the intersection and vehicles may be delayed up to several signal cycles. The traffic operation can geenrally be described as poor.

Level of Service F

Level of Service F represents a jammed condition. Backups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the approach under consideration. Hence, volumes of vehicles passing through the intersection vary from signal cycle to signal cycle. Because of the jammed condition, this volume would be less than capacity.

APPENDIX B

Microclimate Impact Study

I. INTRODUCTION

Architects, engineers, and city planners designing urban structures are limited by the lack of information on wind effects due to structures, such as pedestrian discomfort and wind-caused mechanical problems with doors, windows, and ventilating systems. Once a structure is built, remedial measures (if they exist at all) usually are expensive.

It is virtually impossible to anticipate, by analysis or intuition, the winds that will be caused by a structure, as they are determined by complex interactions of forces. Fortunately it is possible to predict the wind patterns and pressures around structures by testing scale models in a wind tunnel which can simulate natural winds near the ground. This allows the designer to foresee possible environmental and mechanical problems and alleviate them before the building is erected.

Data from wind tunnel tests can be combined with climatological data in analysis of the effect of a proposed structure on pedestrians in terms of human comfort. The frequency distribution of wind strengths at pedestrian level, combined with temperature data and shadow patterns of the proposed structure and its surroundings, can be used to forecast comfort at pedestrian levels.

II. SUMMARY

Wind tunnel tests of a scale model was conducted for the existing site and the proposed project for the two most frequent wind directions in San Francisco. The project site was found to have generally low winds for both the westerly and northwesterly directions. The wind environment would not change with construction of the proposed project, as the project area is sheltered by upwind highrises. The project would increase shadows in winter along the surrounding streets. The pedestrian walkway extending to Spear Street from the east face of the building would be shaded in all seasons except summer.

III. BUILDING AND SITE DESCRIPTION

The project site is near the center of the block bordered by Main Street, Mission Street, Howard Street and Spear Street. The site is located generally east of the downtown highrise corridor along Market Street.

The proposed building would be 19 stories high. A rectangular tower would front on Main Street. The main entry way would be from Spear Street to the east side of the office tower through a pedestrian walkway.

IV. MODEL AND WIND TUNNEL FACILITIES

Model

Scale models of the proposed building and the structures surrounding the area for a distance of several blocks were constructed of polystyrene and urethane foams at a scale of 1 inch equals 30 feet. Building configurations and heights were obtained from the Sanborn maps at the San Francisco Department of City Planning and from site visits. All proposed projects and projects under construction near the site were included in the model.

Wind Tunnel Facilities

The Environmental Impact Planning Corporation boundary layer wind tunnel was designed specifically for testing architectural models. The working section is 7 feet wide, 43 feet long, and 5 feet high. Wind velocities in the tunnel can be varied from 3.5 mph to 13 mph. The flow characteristics around sharp-edged objects, such as architectural models, are constant over the entire speed range. Low speeds are used for tracer smoke, high speeds for windspeed measurements.

Simulation of the characteristics of the natural wind is facilitated by an arrangement of turbulence generators and roughness upwind of the test section. These allow adjustments in wind characteristics to provide for different scale models and varying terrain upwind of the project site.

Measurements of windspeed around the model are made with a hot-wire anemometer, a device that relates the cooling effect of the wind on a heated wire to the actual windspeed. The flow above the city is measured by a Pitot tube connected to a micromanometer. The Pitot tube and micromanometer measure directly the pressure difference between moving and still air. This pressure difference is then related to the actual windspeed. Flow visualization is achieved by use of floodlit smoke.

V. TESTING METHODOLOGY

Simulation of Flow

The most important factors in ensuring similarity between flow around a model in a wind tunnel and flow around the actual building are the structure of the approach flow and the geometric similarity between the model and the prototype. A theoretical discussion of the exact criteria for similarity is not included in this paper, but may be found elsewhere (Cermak, 1966, or Cermak and Arya, 1970)

The variation of windspeed with height (wind profile) was adjusted for the scale of the model and the type of terrain upwind of the the site. The profiles used were those generally accepted as adequately describing the flow over that type of terrain (Lloyd, 1967).

Testing Procedure

The windflow characteristics of the site in its current state were investigated to ascertain the present wind environment. Windspeeds and wind directions at specified points throughout the site were measured and recorded. Wind direction was measured by releasing smoke at each point and recording the direction in which the smoke traveled. Windspeed measurements were made at the same points, at a scale height of 5 feet above the ground. A hotwire anemometer probe is required to make these measurements within a fraction of an inch of the model surfaces. The probe is repeatedly calibrated against the absolute reading of a Pitot tube and micromanometer. Velocity readings close to the model are generally accurate to within 10% of the true velocity. The grid of measurement points extended to the point where project impacts were less than 10% of existing windspeeds.

Measurements for the building are made by keeping the probe in place while replacing the existing buildings with each proposal under consideration. The grid of measurement points extended to the point where project impacts were less than 10% of existing windspeeds.

Before and after each test run, a calibration measurement was made above the model. The purpose of these measurements was to relate the wind tunnel measurements to actual wind records from U.S. Weather Service wind instrumentation located on the Federal Building at 50 Fulton Street.

VI. TEST RESULTS AND DISCUSSION

Tests of windspeed and wind direction were conducted for 2 wind directions.

Measured windspeeds are expressed as percentages of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station. Thus, a plotted value of 52 means that the measured windspeed is expected to be 52% of the windspeed recorded by the Weather Service when winds are from that particular direction.

The plotted values can be interpreted in terms of general "windiness" using the scale below. This scale is subjective and is based on information gathered from similar studies in San Francisco.

Velocity	Percentage of Calibration Windspeed
Low	0-0.19
Moderately low	0.20-0.29
Moderate	0.30-0.49
Moderately high	0.50-0.69
High	0.70-1.00
Very high	greater than 1.00

The plotted values are not actual windspeeds, but ratios. Thus, a point having a "very high" windspeed ratio would still experience light winds on a near-calm day. Likewise, a point found to have "low" winds could experience significant winds on a windy day.

Wind direction is indicated by an arrow pointing in the direction of flow. Where wind direction fluctuated, two arrows representing the principal flow directions were plotted.

Areas of fluctuating winds are normally turbulent, as are areas of spiraling motion; the latter are denoted by curved arrows.

Northwest Wind

Northwest winds occur 12 to 39% of the time in San Francisco, depending on the season. (In meteorology, a northwest wind blows from the northwest). Northwesterly and westerly winds are the most frequent and the strongest winds at all seasons in San Francisco. Northwest winds exceed 13 miles per hour 35% of the time and 25 miles per hour 3% of the time in summer. (These windspeed categories are used because wind frequency data are broken down into categories of 4-13 mph, etc.) Wind frequencies and speeds are lower in spring, fall, and winter.

Existing site conditions under northwest winds are shown in Figure 1. Existing windspeed ratios are shown in Figure 1. Ratios are low along near all streets near the project site.

No changes in the wind pattern or speeds were found for the proposed project (Figure 2). The pedestrian walkway was found to have low winds.

West Wind

West winds occur between 15 and 40% of the time, depending on the season. They exceed 13 miles per hour 20% of the time and 25 miles per hour 7% of the time in summer. Wind strengths and frequencies are somewhat lower in spring, fall and winter.

Existing conditions for west winds are shown in Figure 3. Windspeed ratios are low to moderately low along near the site.

Only minor changes in the wind pattern and measured windspeed ratios would occur for the proposed project (Figure 4). The pedestrian walkway would have low windspeed ratios.

VII. SHADOW PATTERN ANALYSIS

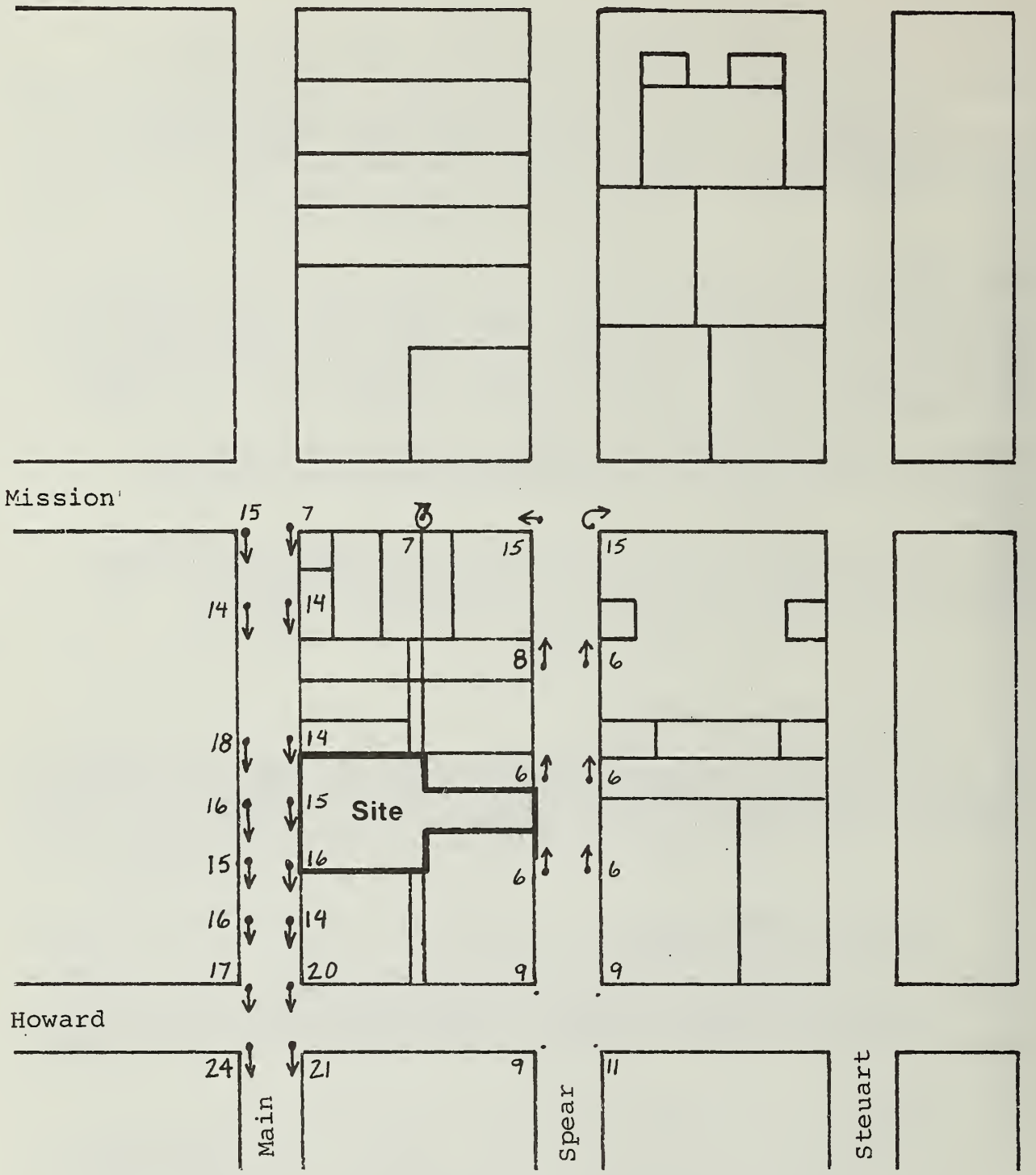
Sun-shade patterns for the first day of each season at 8 a.m., 1 p.m. and 4 p.m. are shown in Figures 5 to 7. The project would increase infill shadows along the surrounding streets.

VIII. MITIGATION MEASURES

There are 2 types of mitigating measures for wind. The first is to make major design changes to reduce winds near the project, such as different building orientations or changes in size or shape.

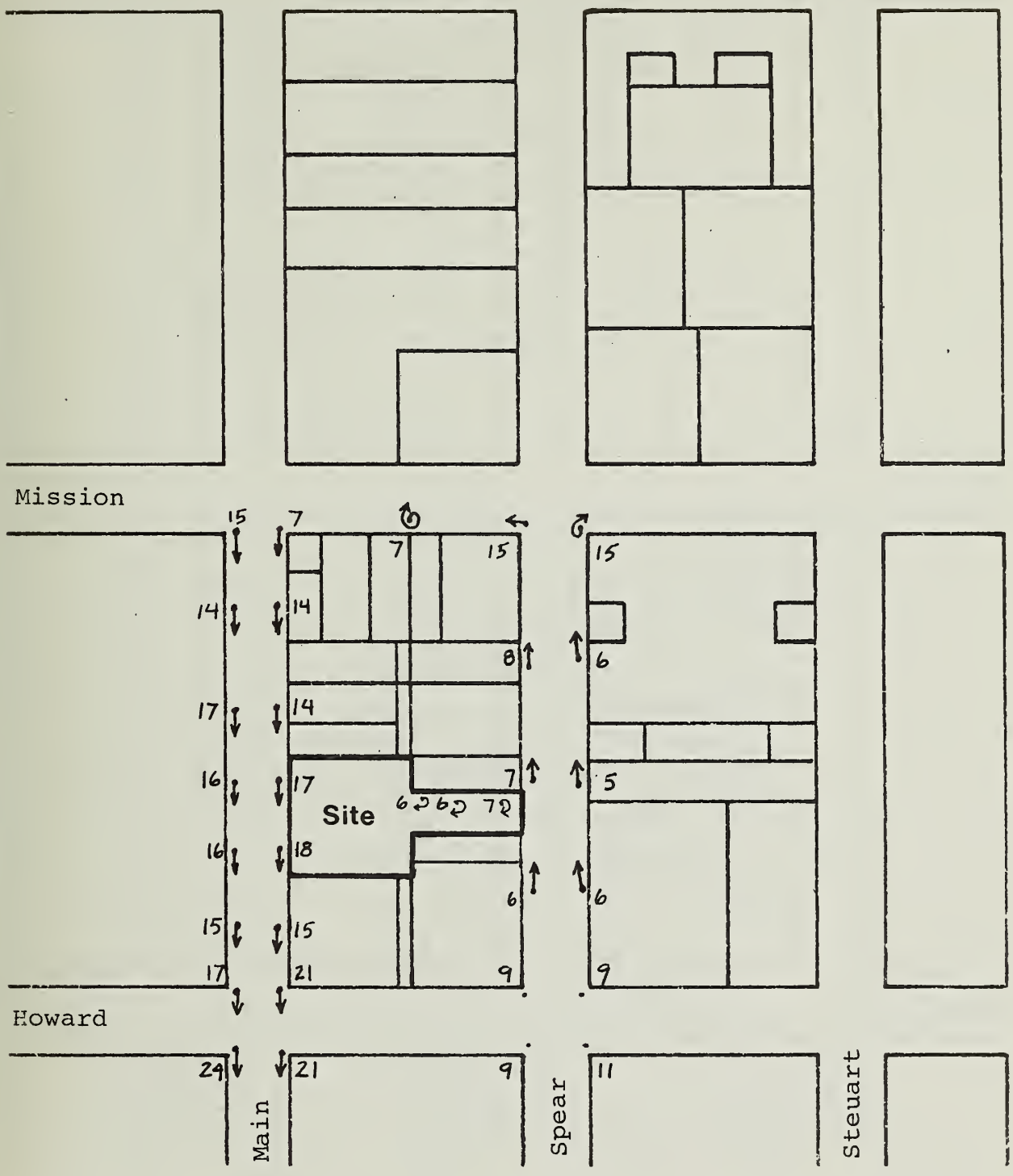
The second type of mitigation measure involves additions to the project that would provide local shelter for pedestrians. Small structures such as kiosks for newspaper or flower vendors, telephone booths, and shelters at bus stops can serve in this way. Similarly, street trees and other vegetation can function as windbreaks.

Because the proposed project does not significantly alter the existing wind environment, mitigation measures for wind do not appear necessary.



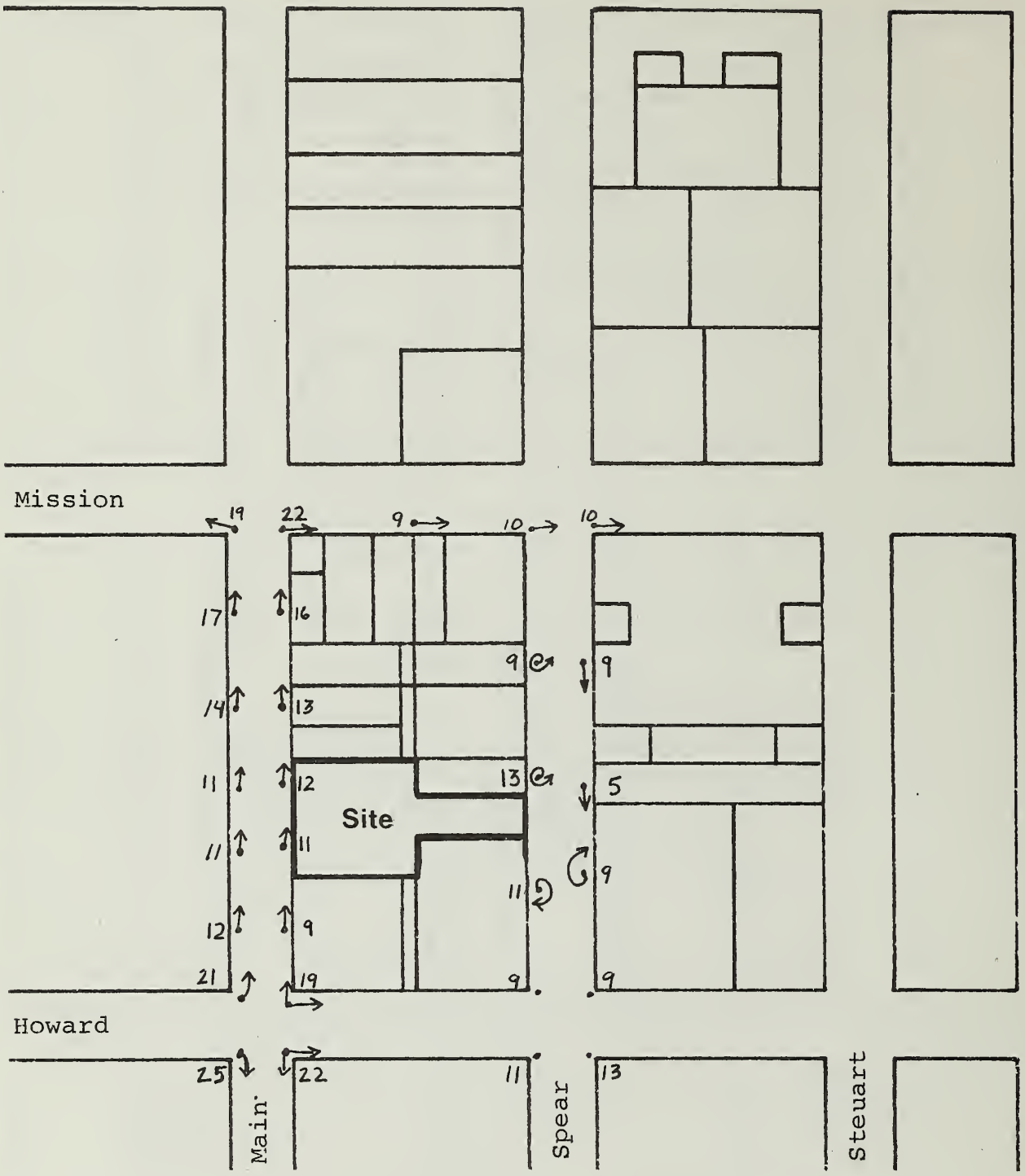
Existing Site
Northwest Winds

Figure No. 1



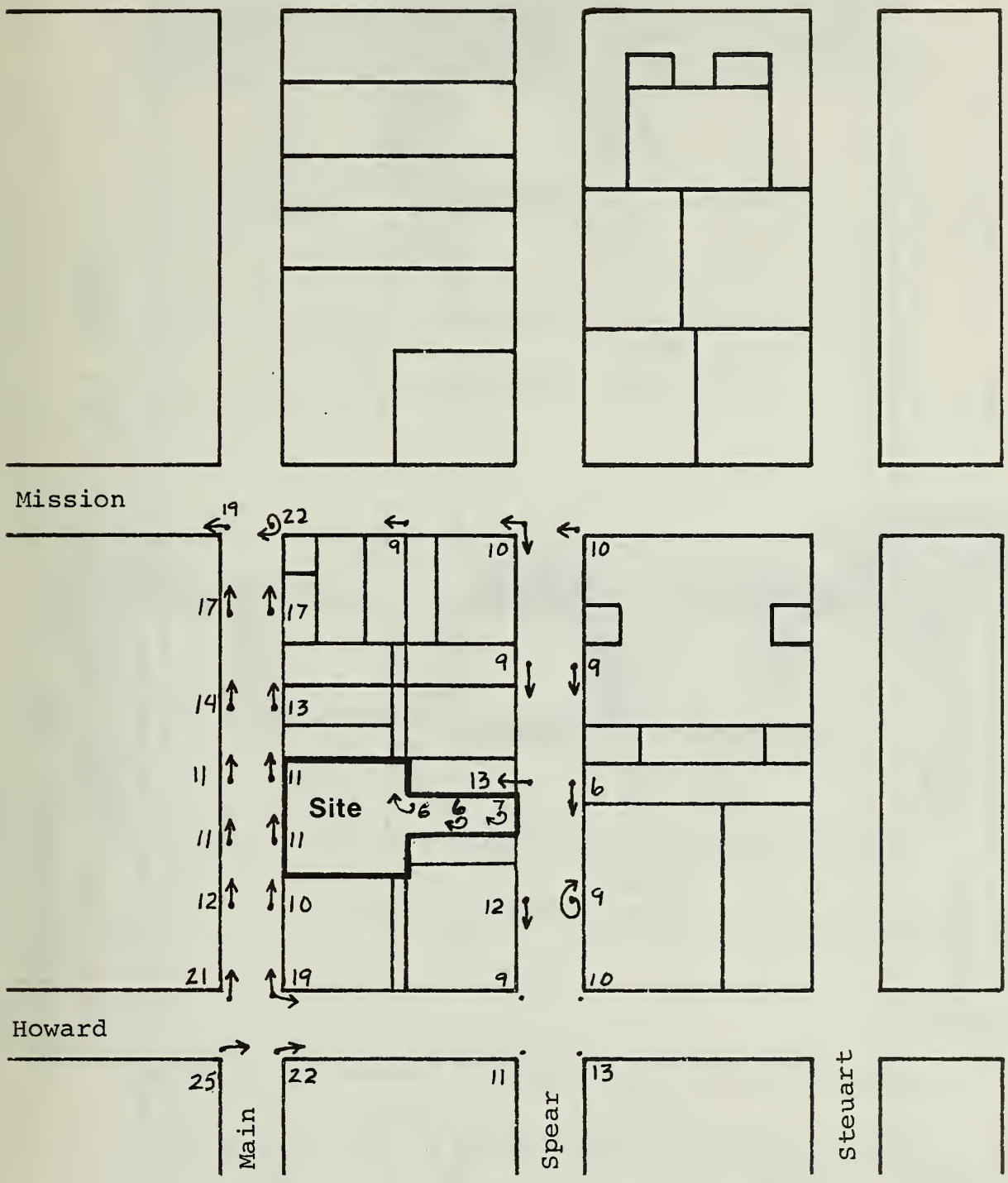
Proposed Project
Northwest Winds

Figure No. 2



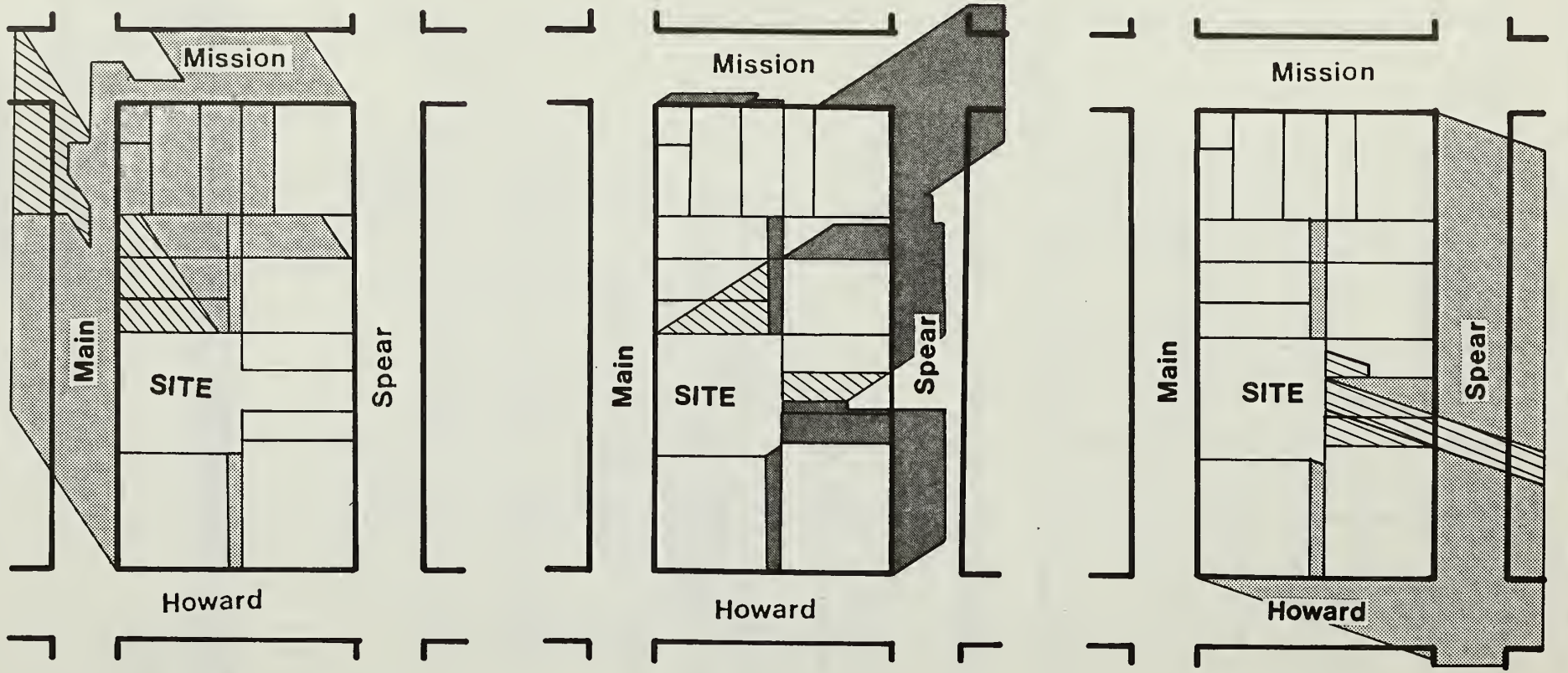
Existing Site
West Winds

Figure No. 3



Proposed Project
West Winds

Figure No. 4



North

0 75 150 300

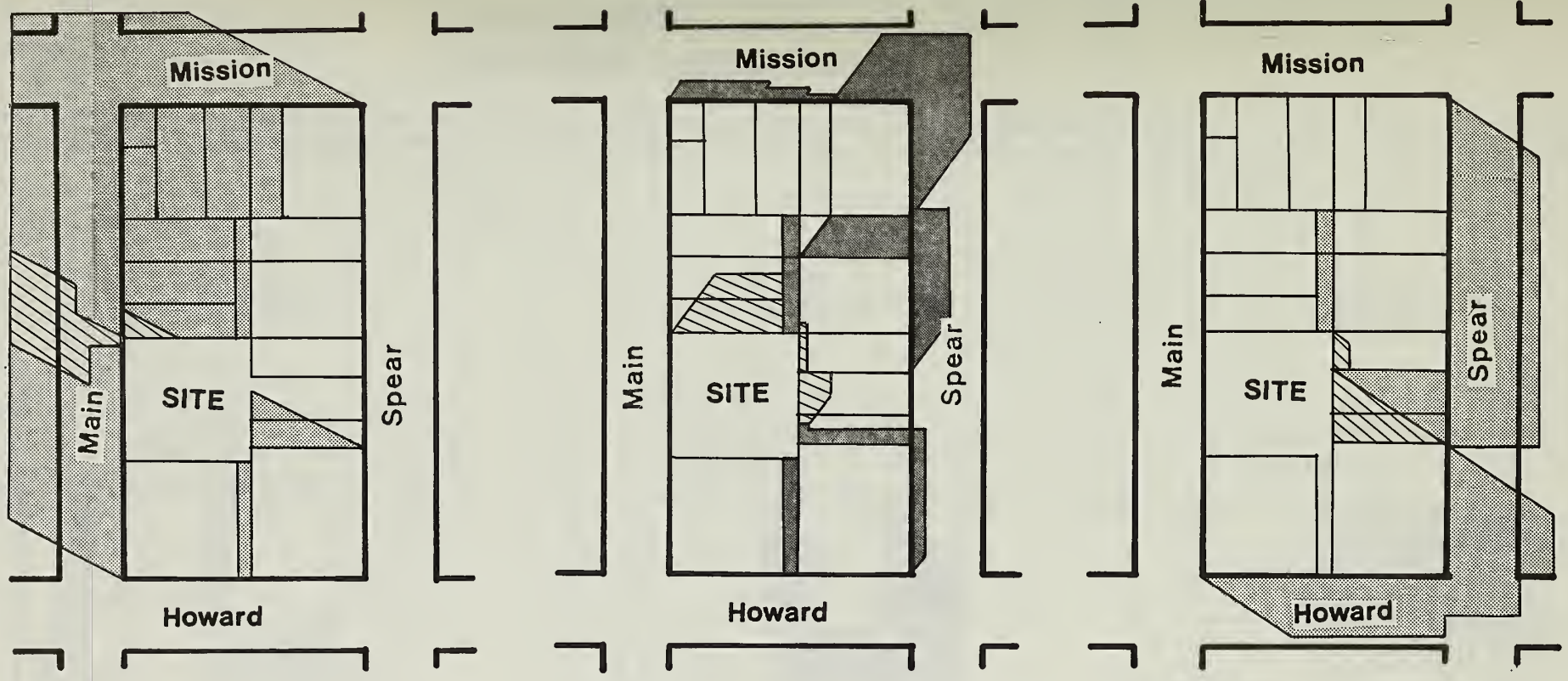
Scale Feet

Figure No. 5

Shadow Patterns - March 21 and September 21

Existing Shadows

Shadows added by Project



North

0 75 150 300

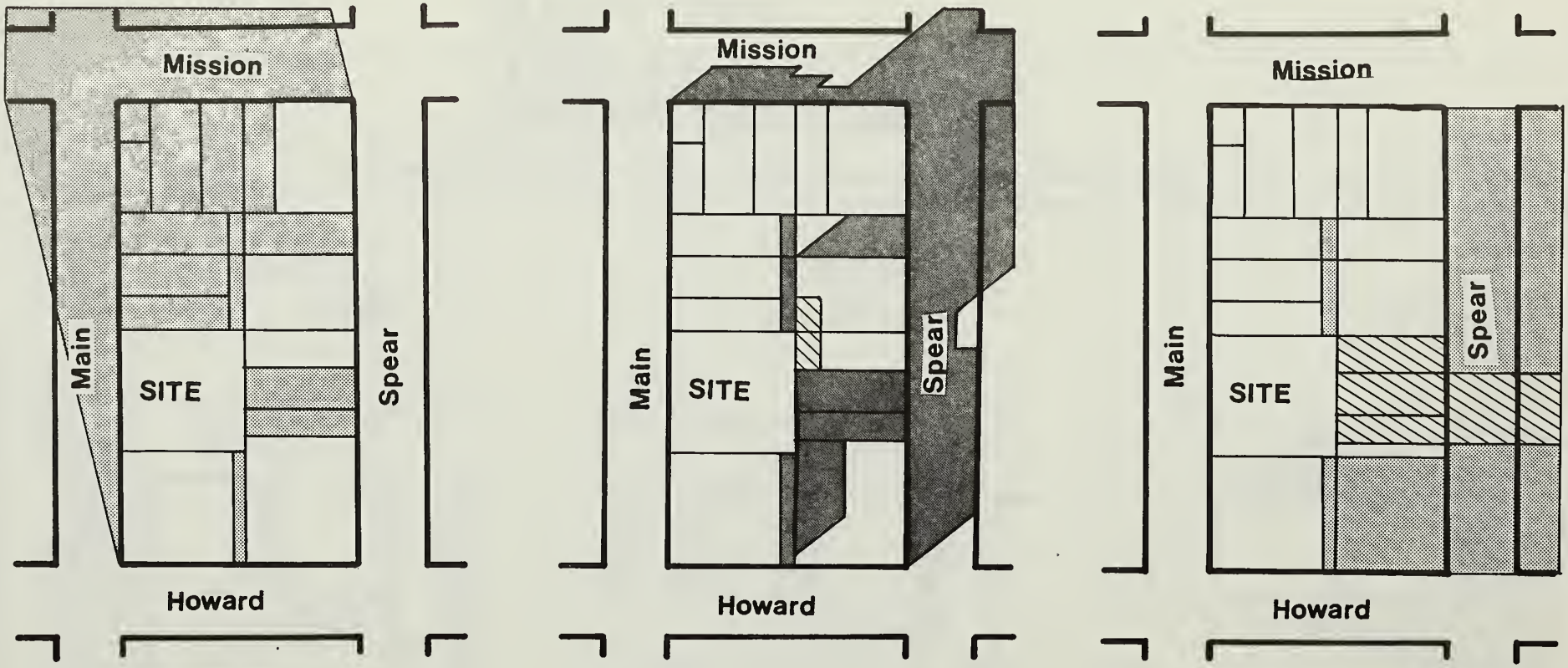
Scale Feet

Figure No. 6

Shadow Patterns June 21,

Existing Shadows

Shadows added by Project



North

0 75 150 300

Scale Feet

Figure No. 7

Shadow Patterns December 21,

Existing Shadows

Shadows added by Project

APPENDIX C

Fundamental Concepts of Environmental Noise

This section provides background information to aid in understanding the technical aspects of this report.

Three dimensions of environmental noise are important in determining subjective response. These are:

a. the intensity or level of the sound;
b. the frequency spectrum of the sound;
c. the time-varying character of the sound.

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB), with 0 dB corresponding roughly to the threshold of hearing.

The "frequency" of a sound refers to the number of complete pressure fluctuations per second in the sound. The unit of measurement is the cycle per second (cps) or Hertz (Hz). Most of the sounds which we hear in the environment do not consist of a single frequency, but of a broad band of frequencies, differing in level. The quantitative expression of the frequency and level content of a sound is its sound spectrum. A sound spectrum for engineering purposes is typically described in terms of octave bands which separate the audible frequency range (for human beings, from about 20 to 20,000 Hz) into ten segments.

Many rating methods have been devised to permit comparisons of sounds having quite different spectra. Fortunately, the simplest method correlates with human response practically as well as the more complex methods. This method consists of evaluating all of the frequencies of a sound in accordance with a weighting that progressively and severely deemphasizes the importance of frequency components below 1000 Hz, with mild deemphasis above 5000 Hz. This type of frequency weighting reflects the fact that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency midrange.

The weighting curve described above is called "A" weighting, and the level so measured is called the "A-weighted sound level", or simply "A-level".

The A-level in decibels is expressed "dBA"; the appended letter "A" is a reminder of the particular kind of weighting used for the measurement. In practice, the A-level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. All U.S. and international standard sound level meters include such a filter. Typical A-levels measured in the environment and in industry are shown in Figure A-1.

Although the A-level may adequately describe environmental noise at any instant in time, the fact is that the community noise level varies continuously. Most environmental noise includes a conglomeration of distant noise sources which

creates a relatively steady background noise in which no particular source is identifiable. These distant sources may include traffic, wind in trees, industrial activities, etc. These noise sources are relatively constant from moment to moment, but vary slowly from hour to hour as natural forces change or as human activity follows its daily cycle. Superimposed on this slowly varying background is a succession of identifiable noisy events of brief duration. These may include nearby activities or single vehicle passages, aircraft flyovers, etc., which cause the environmental noise level to vary from instant to instant.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. The L10 is the A-weighted sound level equaled or exceeded during 10 percent of a stated time period. The L10 is considered a good measure of the "average peak" noise. The L50 is the A-weighted sound level that is equaled or exceeded 50 percent of a stated time period. The L50 represents the median sound level. The L90 is the A-weighted sound level equaled or exceeded during 90 percent of a stated time period. The L90 is used to describe the background noise.

As it is often cumbersome to describe the noise environment with these statistical descriptors, a single number descriptor called the Leq is also widely used. The Leq is defined as the equivalent steady-state sound level which in a stated period of time would contain the same acoustic energy as the time-varying sound level during the same time period. The Leq is particularly useful in describing the subjective change in an environment where the source of noise remains the same but there is change in the level of activity. Widening roads and/or increasing traffic are examples of this kind of situation.

In determining the daily measure of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises.

During the nighttime, exterior background noises are generally lower than the daytime levels. However most household noise also decreases at night and exterior noises become very noticeable. Further most people are sleeping at night and are very sensitive to noise intrusion.

To account for human sensitivity to nighttime noise levels a descriptor, Ldn, (day-night equivalent sound level) was developed. The Ldn divides the 24-hour day into the daytime of 7 am to 10 pm and the nighttime of 10 pm to 7 am. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Ldn, then, is the A-weighted average sound level in decibels during a 24-hour period with 10 dBA added to the hourly Leqs during the nighttime. For highway noise environments the Leq during the peak traffic hour is approximately equal to the Ldn.

The effects of noise on people can be listed in three general categories:

1) subjective effects of annoyance, nuisance, dissatisfaction;
2) interference with activities such as speech, sleep, learning;
3) physiological effects such as startle, hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Unfortunately, there is as yet no completely satisfactory measure of the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance, and habituation to noise over differing individual past experiences with noise.

Thus, an important parameter in determining a person's subjective reaction to a new noise is the existing noise environment to which one has adapted: the so-called "ambient" noise. "Ambient" is defined as "the all-encompassing noise associated with a given environment, being a composite of sounds from many sources, near and far". In general, the more a new noise exceeds the previously existing ambient, the less acceptable the new noise will be judged by the hearers.

With regard to increases in noise level, knowledge of the following relationships will be helpful in understanding the quantitative sections of this report:

a) Except in carefully controlled laboratory experiments, a change of only 1 dBA cannot be perceived.
b) Outside of the laboratory, a 3-dBA change is considered a just-noticeable difference.
c) A change in level of at least 5 dBA is required before any noticeable change in community response would be expected.
d) A 10-dBA change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

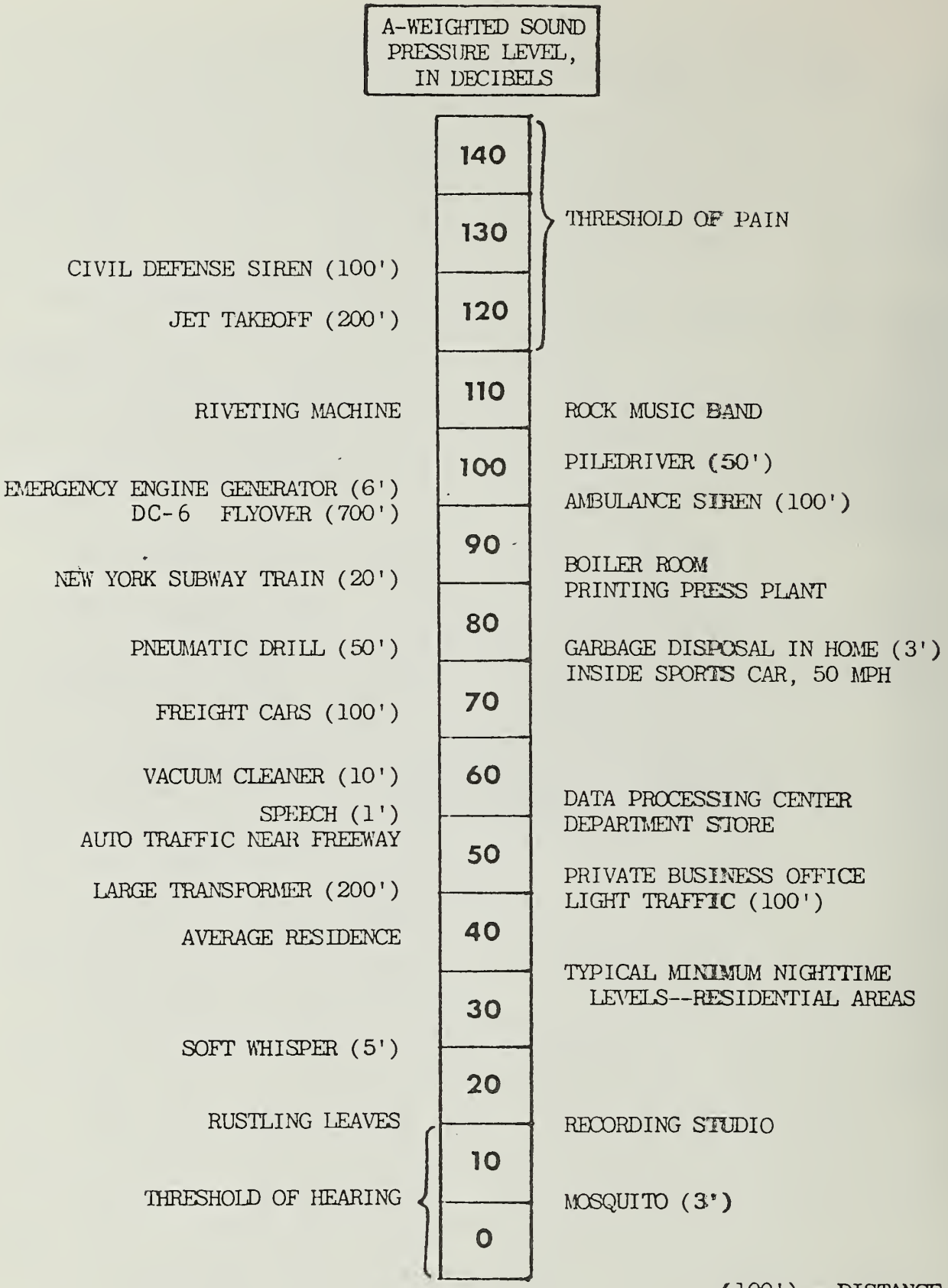


FIGURE A-1: TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

APPENDIX D

Table 1

Estimated Replacement Costs of Proposed Project

Total property tax revenues shown in Table were based on replacement cost estimate as follows:

	Millions of Dollars
Land (already owned, 1980 assessed value)	0.5
Construction cost[1]	
Shell	18.0
Interior finish	5.5
Interim financing @ 15%[2]	3.5
Leasing costs @ 5%	1.2
Total	$28.7

[1] Does not include tenant improvements, which would be taxed as personal property.

[2] The interim financing is included as it represents the total development cost on which the property tax would be calculated.

TABLE 2

Summary of Recent Studies on Downtown's Fiscal Impact

STUDY, AUTHOR, DATE	PURPOSE OF STUDY	DATA SOURCES	STUDY METHODOLOGY	CONCLUSIONS
"Fiscal Concerns" in Downtown San Francisco Conservation and Development Planning Program, Phase I Study, Sedway/Cooke, et al., October 1979, pp. 56-59.	To qualitatively assess the likely fiscal impact of new development in the C-3 area under existing zoning ordinances and under Proposition O.	SPUR Study (1975)	SPUR cost/revenue estimates for downtown in 1973 and for projected growth 1974-1990 were assumed. Proposition 13's effect on revenues and the possible need for increased transportation infrastructure were considered. Generalized conclusions about fiscal impact of new development were drawn.	1) After Proposition 13, "costs may exceed revenues in the downtown by as much as 25%." 2) "[N]ew downtown development will not solve the city's growing fiscal problem; without new revenue sources, development will make it worse in the long run."
Downtown Highrise District Cost Revenue Study, Arthur Andersen & Co., November 1980	To quantify for 1976-77 and 1978-79 how much revenue the C-3-O area generated and how much it cost to provide city services to the area.	Data compiled from city records and through conversations with city officials.	The study counted only revenues generated within the C-3-O and costs of providing services to the C-3-O. "The principle guiding the study methodology was to calculate the amount of revenue that San Francisco would lose and the costs that could be reduced if the Downtown Highrise District were a separate city."	The C-3-O generated $56.79 million in 1976-77, or 61% more than the cost of city services to the area. In 1978-79, revenues were $53.29 million, or 48% greater than costs.
"Fiscal Considerations" Appendix C, 101 Montgomery Street DEIR, Recht Hausrath & Associates, January 1981.	To draw generalized conclusions about "how new development downtown in a post-Proposition 13 environment is likely to change the City's fiscal health from what it would be without new development."	SPUR study, city records and conversations with city officials.	Conclusions were drawn about how revenues differ between existing and new buildings, and how costs differ between existing and new buildings. Then, under alternative assumptions about the cost/revenue balance in existing buildings and in new buildings, the fiscal impact over time of new development was compared to that of no new development.	"[A]n on-going process of new development would improve the City's fiscal situation." This beneficial impact would cease if new development were halted. This conclusion is tentative due to uncertainties about increased Muni costs.
Downtown Highrise District Cost/Revenue Study, David Jones, February 1981.	To quantify for 1978-79 the revenues generated by businesses in the C-3-O and the service costs imposed on the city and BART by the C-3-O.	Arthur Andersen study.	The Jones study differs from the Andersen study primarily as follows: 1) Costs of BART (but not revenues to BART) are included; 2) Only revenues paid by businesses and building owners are considered; 3) Muni deficit is computed differently; 4) Most costs are estimated as a percentage of revenues rather than on the basis of actual service demand in the C-3-O.	The C-3-O imposed costs of $94.4 million on San Francisco and BART, or 125% more than the revenues the area's businesses and building owners generated to San Francisco.
Fiscal Impacts of New Downtown High-Rises on the City and County of San Francisco, Gruen Gruen & Associates, March 1981.	To quantitatively estimate city revenues from the C-3-O and costs of servicing the C-3-O in 1998, assuming the addition of 30 million square feet of building space in the C-3-O between 1981 and 1998.	Arthur Andersen study; data compiled from city records and through conversations with city officials.	"Only direct effects are considered." Costs are only measured for services "provided within the physical limits of the C-3-O district" and revenues are limited to "taxes on buildings within the district and the activities that take place within those buildings." Assumes the Arthur Andersen study is accurate and builds upon it.	In 1980, revenues from the 39 million square feet of building space in the C-3-O were 1.66 times as large as costs. In 1998, after completion of the 30 million square feet of new space, revenues from the entire 69 million square feet of C-3-O building space would increase to 1.92 times as large as costs.

Source: Recht-Hausrath and Associates in FEIR ee 80.26,101 Montgomery Street, certified 7 May 1981